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stay connected

Manual IMPACT67-EC

- Installation
- Configuration Notes
- Startup
- Mapping I/O Data
- Diagnostics
- Technical Data

Publisher's Note

User Manual for

IMPACT67 EC DI16 (Article Number: 55081)

IMPACT67 EC DI8 DO8 (Article Number: 55082)

IMPACT67 EC DO8 (Article Number: 55083)

IMPACT67 EC DO16 (Article Number: 55084)

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Service and Support

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In addition, our Customer Service Center (CSC) will be glad to assist you:

Our Customer Service Center can support you throughout your project: planning and the conception of customer applications, configuration, installation, and startup. We also offer competent consulting or – in more complex cases – we even provide direct onsite support.

The Customer Service Center provides support tools. It performs measurements for fieldbus systems, such as ProfiBus DP, DeviceNet, CanOpen, and AS interface, as well as energy, heat, and EMC measurements.

Our coworkers at the Customer Service Center provide their competence, know-how, and years of experience. They are knowledgeable about hardware and software, and compatibility with products made by various manufacturers.

You can contact the Customer Service Center at

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or by email at csc@murrelektronik.de.

About the User Manual and its Structure

Bus Manual:
General explanations and functions for each bus.

On this subject, please click on the links to the next page.

System/Product Manuals:
Describe the system and product-specific features.

Art. No.	Designation
55364	Impact67 ProfiBus
55365	Impact67 CanOpen
55367	Impact67 DeviceNet
55366	Impact67 ProfiNet
55368	Impact67 EtherNet/IP
55369	Impact67 EtherCat

www.murrelektronik.com

Here are links to the BUS user manuals:

>>> EtherCAT (www.ethercat.org)

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Important Information

Symbols and Icons

This manual contains information and instructions you must comply with in order to maintain safety and avoid personal injury or damage to property. They are identified as follows:

Notes indicate important information.

Warnings contain information that, if you ignore this information, may cause damage to equipment or other assets or, if you fail to comply with safety precautions, may constitute a danger to the user's health and life.

These instructions are recommendations issued by Murrelektronik.

Intended Purpose

Before starting the devices, read this manual carefully. Keep it in a location that is accessible to all users at all times.

The products that are described in this manual were developed, manufactured, tested, and documented in compliance with the relevant safety standards. In normal cases, these products do not constitute any danger to persons or objects, provided the handling specifications and safety instructions described in this manual are observed. They conform to the requirements of

- EMC Directive (2004/108/EC)

The products are designed for industrial use. An industrial environment is defined as one in which loads are not connected directly to the public low-voltage power grid. Additional measures must be taken if the products are used in private, business, or trade environments.

The safe, troublefree functioning of the products requires proper transportation, storage, mounting, and installation, and careful operation. Operation of the devices for their intended purposes is only guaranteed when the enclosures are fully mounted. If aggressive media are used, check their material resistance depending on the application.

Current safety and accident prevention laws valid for a specific application must be observed for the configuration, installation, setup, maintenance, and testing of the devices. The power supply must

comply with SELV or PELV. Power sources in accordance with EN 61558-2-6 (transformer) or EN 60950-1 (switched-mode power supply) meet these requirements.

Only use cables that meet the requirements and regulations for safety, electromagnetic compatibility, and, if necessary, telecommunications terminal equipment specifications.

Information on the cables and accessories that are suitable for use with this product are contained in the Appendix to this manual.

Qualified Personnel

Only qualified, trained electricians knowledgeable in the safety standards of automation systems may configure, install, set up, maintain, and test the devices. The requirements concerning qualified personnel are dependent on the requirements profiles described in ZVEI and VDMA. For this reason, electricians must know the contents of the manual "Weiterbildung in der Automatisierung" (Further Training in Automation Systems) published by ZVEI and VDMA published by Maschinenbau-Verlag, Post Box 710864, 60498 Frankfurt, Germany) before installing and maintaining the devices. They are therefore electricians who are capable of assessing the work executed and any possible dangers arising from this due to their professional training, knowledge, experience, and their knowledge of the pertinent standards; or who have a level of knowledge equivalent to professional training due to their many years of activity in a comparable field.

Only Murrelektronik technical personnel are allowed to execute work on the hardware and software of our devices, if they are devices not described in this manual.

Unqualified tampering with the hardware or software, or failure to observe the warnings cited in this manual may result in severe personal injury or damage to property.

1. Description of IMPACT67

Fieldbus modules with IP67 protection are an important module in machine installation and they replace complex wired, and therefore, high-cost terminal boxes. Fieldbuses replace conventional parallel wiring.

An increase in efficiency in installation systems was the prime motivator in developing the IMPACT67. Concentration on what is important, coupled with purposeful connectivity, is our recipe for success to reduce your installation costs.

- Application-specific: compact and dense
- Installation-friendly: well designed and pluggable
- Economic: minimized to what is important

System Design Principle

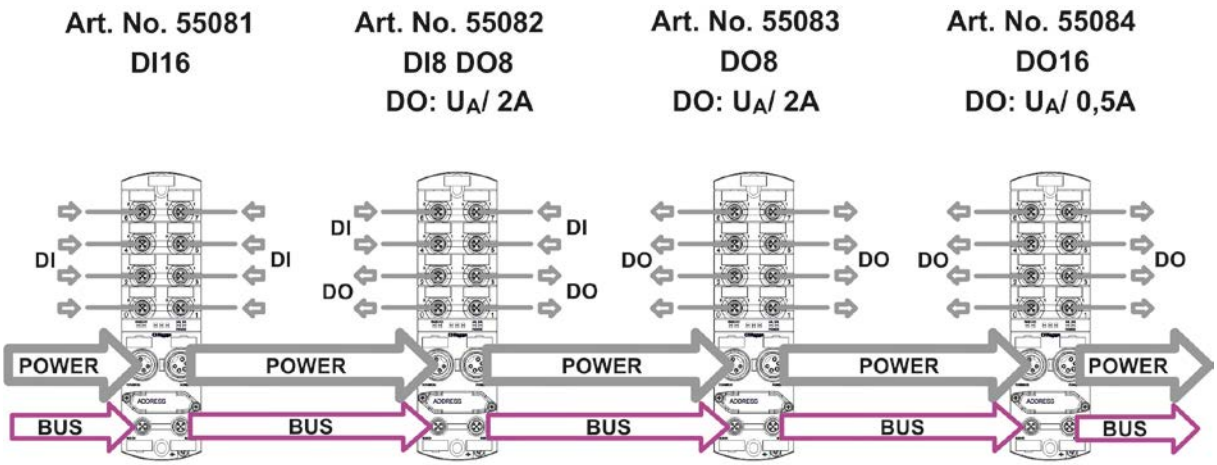


Fig. 1: System design principle

2. Installation

2.1 Mounting

2.1.1 Dimensioning

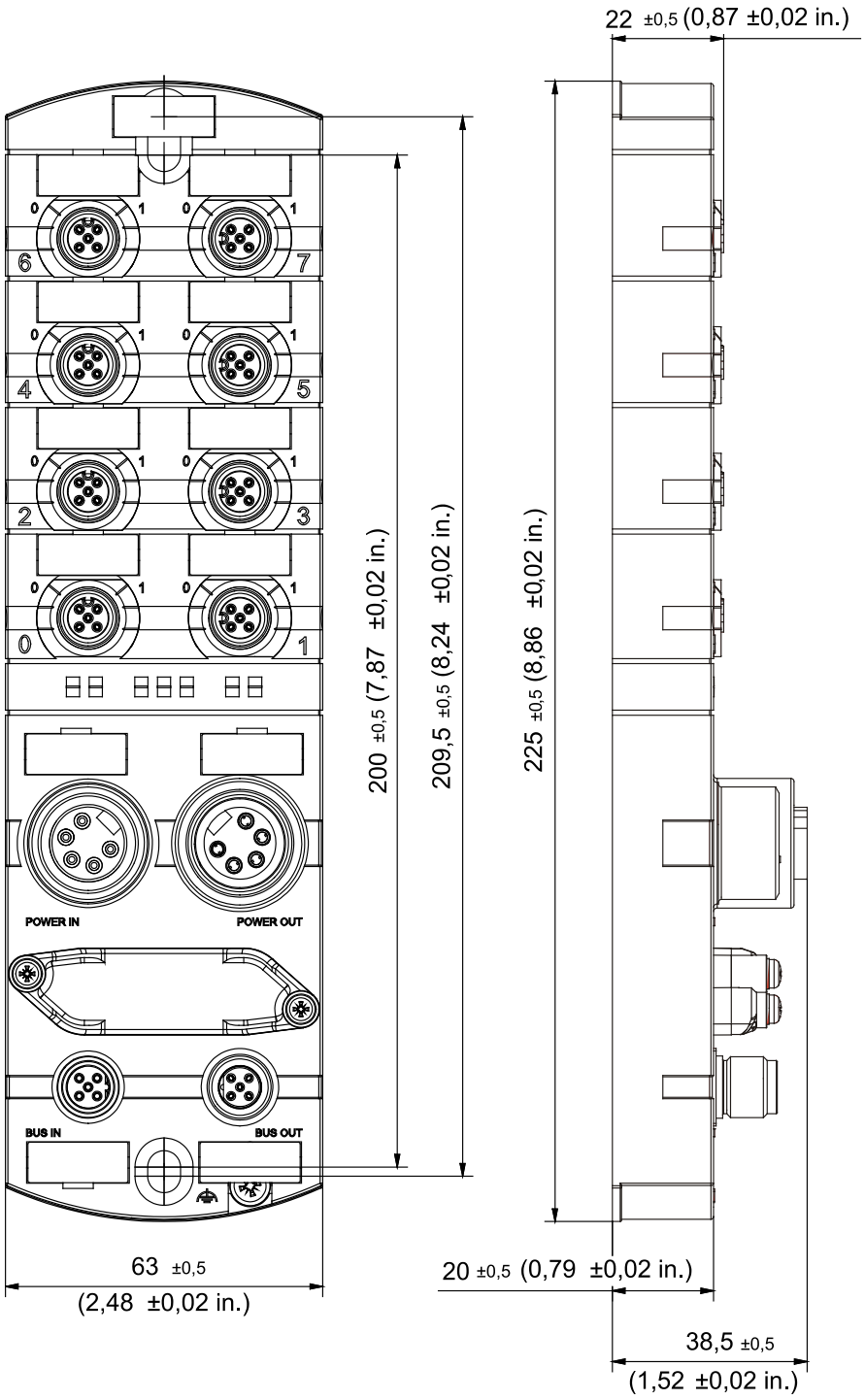


Fig. 2: Dimensioning

2.1.2 Spacing

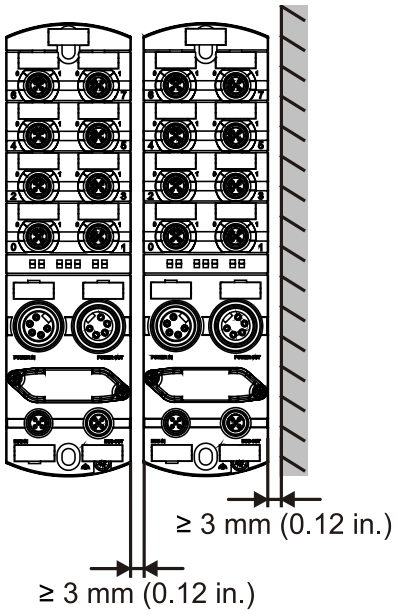


Fig. 3: Spacing

Angled connectors from Murrelektronik require a minimum spacing of 50 mm.

2.1.3 Mounting IMPACT67 Modules

The modules of the IMPACT67 Series can be fitted directly to an installation panel or a machine. The module features two mounting holes for this purpose.

Make sure that the mounting surface is flat and level to prevent mechanical stress in the module housing.

Attach the module using two 6 mm diameter screws and two washers as per DIN 433 T1/T2. The tightening torque is 3 Nm.

Function Ground

The FE connection is located at the bottom facing edge of the module housing. To ensure proper functioning in compliance with the EMC regulations specified in the datasheet, we recommend the use of our grounding strap. It is **not** included in the as-delivered state of the module. You must therefore purchase it separately.

Please refer to the chapter on Accessories.

Connect the FE terminal on the housing at low impedance to the function ground (refer to EMC information).

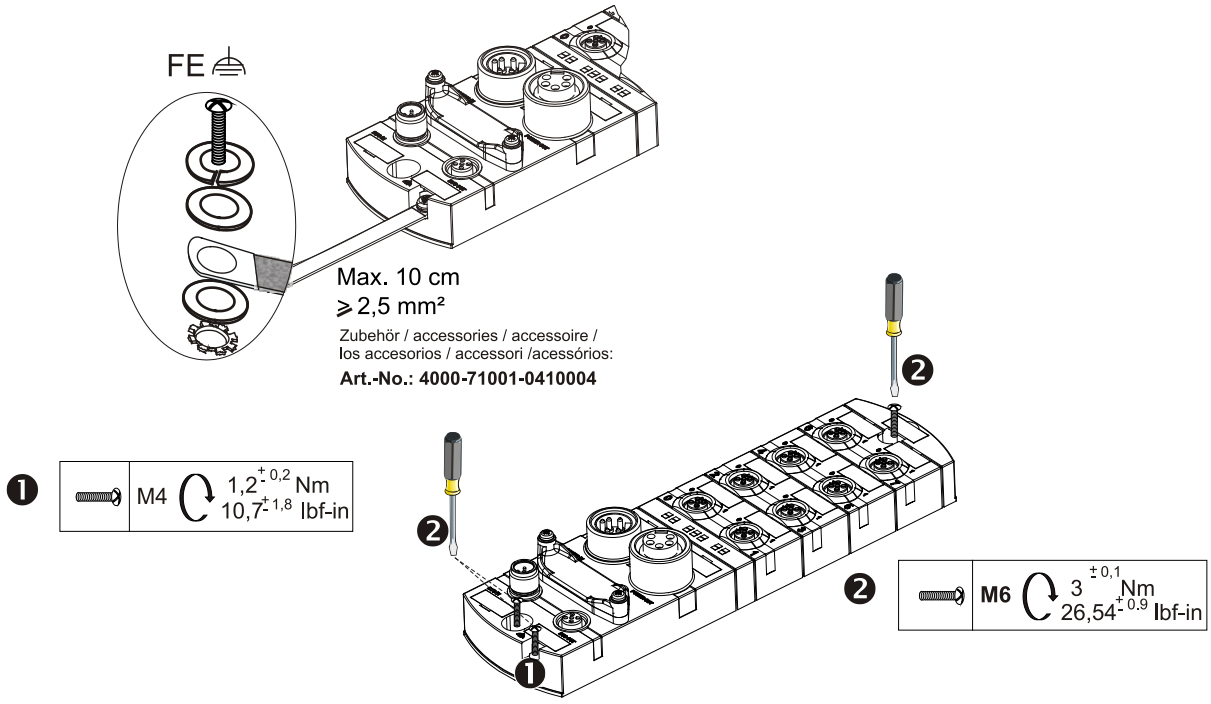


Fig. 4: Mounting

2.1.4 IP67 Protection

IP67 protection is only guaranteed when all sockets are wired up or provided with blank plugs.

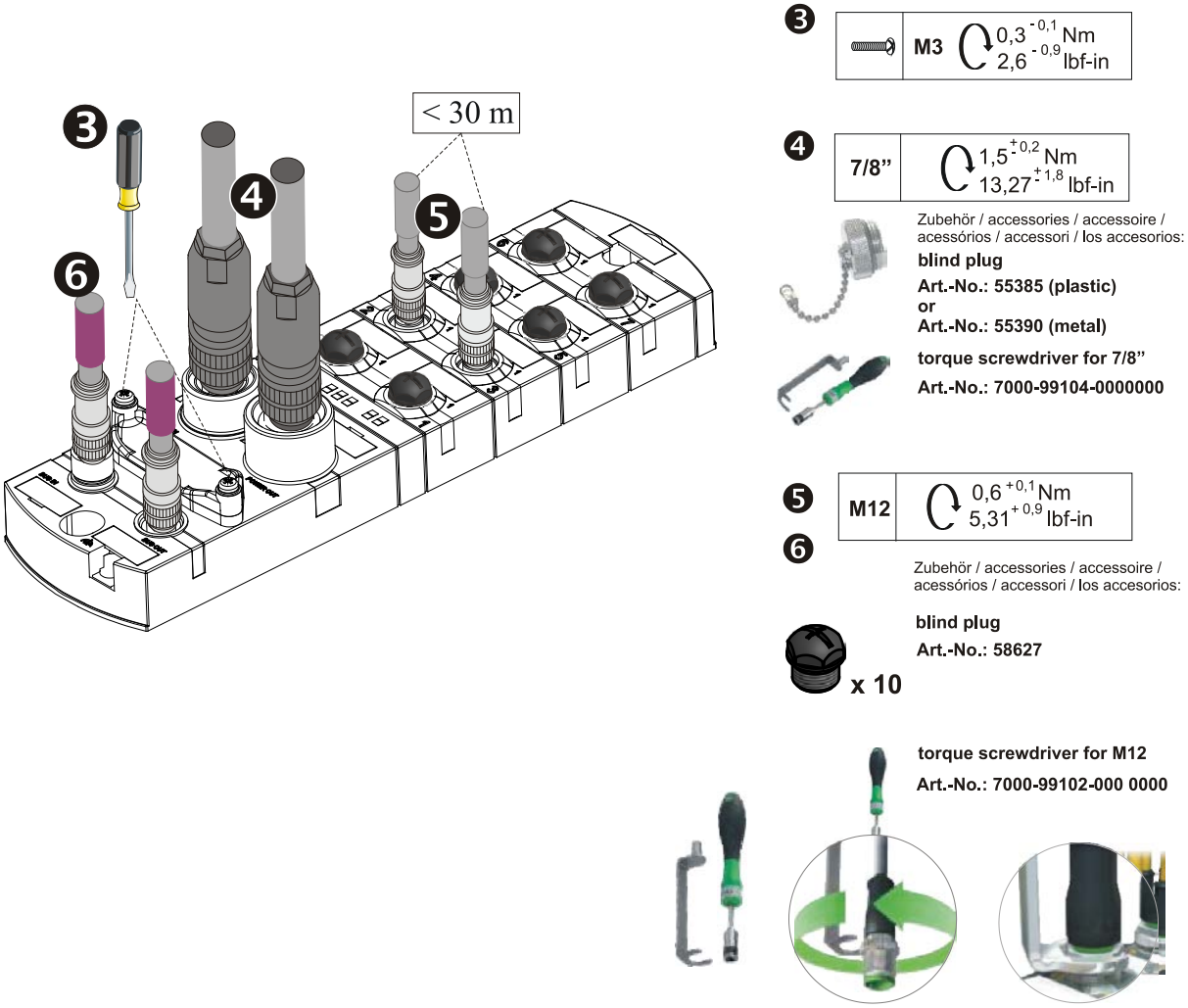
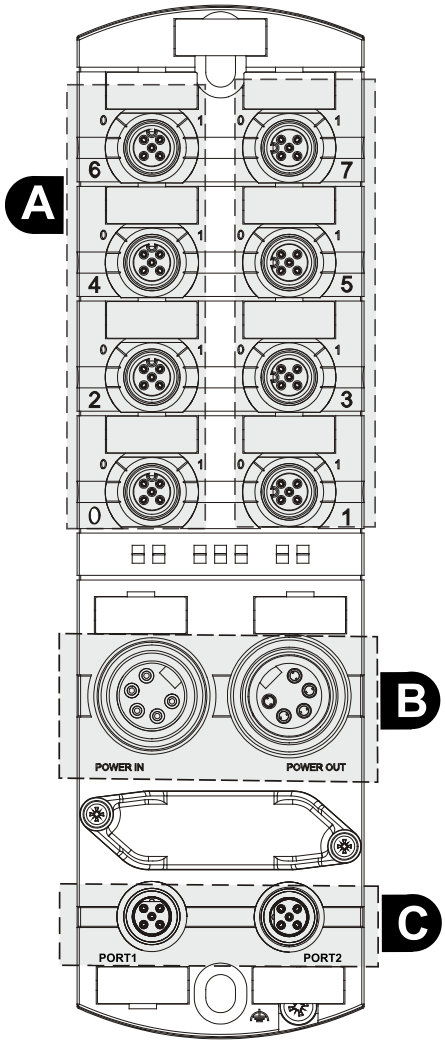


Fig. 5: Example of assembly for IP67

2.2 Connection Diagram of IMPACT67 EC



A **IMPACT67 EC DI16**

M12

Pin 1	+24V Us / 0,2A
Pin 2	DI 10-17
Pin 3	0V
Pin 4	DI 00-07
Pin 5	⏚

A **IMPACT67 EC DI8 DO8**

M12

M12 0, 1, 2, 3		M12 4, 5, 6, 7	
Pin 1	n.c.	Pin 1	24V Us / 0,2A
Pin 2	DO 04-07	Pin 2	DI 04-07
Pin 3	0V	Pin 3	0V
Pin 4	DO 00-03	Pin 4	DI 00-03
Pin 5	⏚	Pin 5	⏚

DO: 8x 2A

A **IMPACT67 EC DO8**

M12

M12 0, 2, 4, 6		M12 1, 3, 5, 7	
Pin 1	n.c.	Pin 1	n.c
Pin 2		Pin 2	n.c
Pin 3	0V	Pin 3	0V
Pin 4	DO 00,02, DO 04,06	Pin 4	DO 01,03, DO 05,07
Pin 5	⏚	Pin 5	⏚

DO: 8x 2A

A **IMPACT67 EC DO16**

M12

Pin 1	n.c.
Pin 2	DO 10-17
Pin 3	0V
Pin 4	DO 00-07
Pin 5	⏚

DO: 16x 0,5A

B

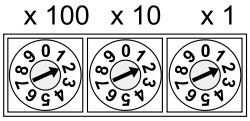
POWER IN	POWER OUT

Pin 1	0V
Pin 2	0V
Pin 3	⏚
Pin 4	+24V U_S / max. 9 A
Pin 5	+24V U_A / max. 9 A

C

PORT1		PORT2
TD +	Pin 1	TD +
RD +	Pin 2	RD +
TD -	Pin 3	TD -
RD -	Pin 4	RD -
n.c.	Pin 5	n.c.
⏚	Gewinde Thread Filet Rosca Filetto Rosca	⏚

2.3 Device ID Rotary Switches



- 0 to 999
- Configured Station Alias Address

Fig. 6: Device ID rotary switches

Disable the module addresses (Device ID) when the "Configured Station Alias Address" is used.

NOTE

Do not connect the 7/8" power supply cord, otherwise the module is not detected.

Each address may only occur once in the system.

2.3.1 Issue and set *Static Alias Address*

- Open the cover of the device ID rotary switches (torque $0.3^{+0,1}$ Nm, $2.6^{+0,9}$ lbf-in).
- Set a unique address using the device ID rotary switches on the connected IMPACT67 modules.
- Close the cover of the device ID rotary switches carefully (torque $0.3^{+0,1}$ Nm, $2.6^{+0,9}$ lbf-in).
-

2.4 Connecting Modules

Please refer to Section 3.2: “Connecting” for more details.

Connect the wires in the sequence indicated below:

1. Connect the functional ground to the FE terminal on the module housing.
2. Connect your IMPACT67 modules to an EtherCAT controller via a M12 Ethernet cable.
3. Connect the sensors and actuators using M12 cables.
4. Hook up the power supply using a 7/8“ power supply cable.
5. Configure your controller (see Section 4.2 “Configuration”).

3. Configuration Notes

3.1 System Components

3.1.1 Product Designation Code

The designation format of IMPACT67 system components explains their function.

Examples:

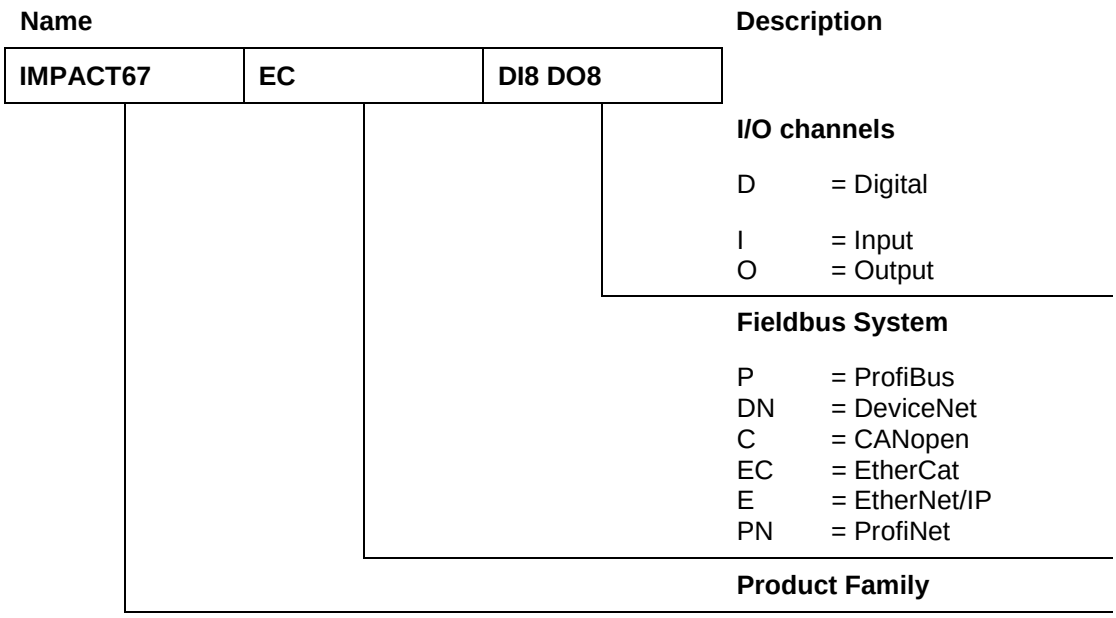


Fig. 7: Example of product designation

3.1.2 IMPACT67 Modules

The purpose of the IMPACT67 system is the decentralized routing of signals at the I/O level and the supply of this information over a Fieldbus network (e.g. ProfiBus, CANopen, DeviceNet, EtherCAT, EtherNet/IP).

The module and I/O units are powered by a 5-pin power plug 7/8" (mini style).

Article Number	Description	
55081	IMPACT67 EC DI16	
55082	IMPACT67 EC DI8 DO8 (2A)	
55083	IMPACT67 EC DO8 (2A)	
55084	IMPACT67 EC DO16 (0.5A)	

Tab. 1: IMPACT67 EC Modules

3.1.3 Accessories

Most cables and connectors are available in angled style.

3.1.3.1 BUS Cables

EtherCAT		
Article Number	**Description**	
	Straight connector / straight connector	Cable length
7000-44511-7980150		1.5 m
7000-44511-7980300		3 m
7000-44511-7980500		5 m
7000-44511-7980750		7.5 m
7000-44511-7981000		10 m

Tab. 2: EtherCAT

EtherCAT		
Article Number	**Description**	
	Straight connector with nonterminated wire end	Cable length
7000-14541-7980150		1.5 m
7000-14541-7980300		3 m
7000-14541-7980500		5 m
7000-14541-7980750		7.5 m
7000-14541-7981000		10 m

Tab. 3: EtherCAT

3.1.3.2 POWER Cables

Power cable 7/8“		
Article Number	**Description**	
	Straight connector / straight socket	Cable length
7000-50021-9610030		0.3 m
7000-50021-9610060		0.6 m
7000-50021-9610100		1 m
7000-50021-9610150		1.5 m
7000-50021-9610200		2 m

Tab. 4: Power cable 7/8“

Power cable 7/8“		
Article Number	**Description**	
	Straight socket with nonterminated wire end	Cable length
7000-78021-9610150		1.5 m
7000-78021-9610300		3 m
7000-78021-9610500		5 m
7000-78021-9610750		7,5
7000-78021-9611000		10 m

Tab. 5: Power cable 7/8“

3.1.3.3 I/O Cables

I/O		
Article Number	**Description**	
	Straight connector yellow with nonterminated wire end	Cable length
7000-12041-0250150		1.5 m
7000-12041-0250300		3 m
7000-12041-0250500		5 m
7000-12041-0250750		7.5 m
7000-12041-0251000		10 m

Tab. 6: I/O

The input/output cables are of course available in all shapes, colors, and combinations.

3.1.3.4 Valve Connector Combination Style A

- Contact spacing 18 mm
- Operating voltage 24 V AC/DC
- Operating current max. 4 A

Article Number	Description	
	M12 top connection	Cable length
7000-41501-2260000		110 mm
7000-41521-2260000		150 mm
7000-41541-2260000		200 mm
	M12 rear connection	Cable length
7000-41561-2260000		110 mm
7000-41581-2260000		150 mm
7000-41601-2260000		200 mm
Other system accessories on request		

Tab. 7: Valve connector combination Style A

3.1.3.5 Valve Connector Style A

- Contact spacing 18 mm
- Operating voltage 24 V AC/DC, pressure switch 24 V DC
- Operating current max. 4 A

Article Number	Description	
7000-41341-0000000	M12 top connection	LED yellow, protection circuit for valves
7000-41361-0000000		LED yellow/green for pressure switch
7000-41461-0000000	M12 rear connection	LED yellow, protection circuit for valves
7000-41481-0000000		LED yellow/green for pressure switch

Tab. 8: Valve connector Style A

We also offer a very wide product portfolio of sensors and actuators. From connectors, cables, adapters, through to special requests.

Please visit our online shop:

onlineshop.murrelektronik.com

3.1.3.6 Connector for Self-Connection

Article Number	Description
7000-14521-0000000	CAT5 Bus M12 connector D-coded, 4-pin, straight
7000-99051-0000000	CAT5 Bus RJ45 D-coded, 4-pin, straight IP20
7000-00000-7989999	Bus cable for EtherCAT, 100 m collar
7000-78081-0000000	Power 7/8“ straight connector 5-pin, self-connecting
7000-78201-0000000	Power 7/8" socket straight 5-pin, self-connecting

Tab. 9: Connector for self-connection

3.1.3.7 Adapter

Article Number	Description	
7000-99052-0000000	Adapter M12 / RJ45, CAT 5, Socket /socket	

Tab. 10: Terminating resistor

3.1.3.8 Blank Plug

Article Number	Description
58627	M12 plastic plug (SP 10 pieces)
55390	7/8" screw plug, metal with chain (SP 1 piece)
55385	7/8" screw plug, plastic (SP 1 piece)

Tab. 11: Blank plug

3.1.3.9 Identification Labels

Article Number	Description
996067	IDENTIFICATION LABELS 20X8MM (SP 10 pieces)

Tab. 12: Identification labels

3.1.3.10 Grounding Strap

Article Number	Description
4000-71001-0410004	Grounding strap 4 mm² 100 mm for M4 (SP 1 piece)

Tab. 13: Grounding strap

3.1.3.11 Torque Wrench

Article Number	Description
7000-99102-0000000	Set of M12 torque wrenches (SP 1 piece)
7000-99104-0000000	Set of 7/8" torque wrenches (SP 1 piece)

Tab. 14: Torque wrench

3.1.3.12 MICO

- – Fire protection (EN 60950-1)
- – Operating voltage protection (EN 61131-2)
- – Operating state memory device (EN 61131-1)

Article Number	Description	Nominal operating branch-circuit current (full load)	
9000-41034-0100400	MICO 4.4 (4 channels)	each 4 A	
9000-41034-0100600	MICO 4.6 (4 channels)	each 6 A	
9000-41034-0401000	MICO 4.10 (4 channels)	each 10 A	
9000-41042-0100400	MICO 2.4 (2 channels)	each 4 A	
9000-41042-0100600	MICO 2.6 (2 channels)	each 6 A	
9000-41042-0401000	MICO 2.10 (2 channels)	each 10 A	

Tab. 15: Overview of MICO variants

Information on products and accessories are available in our catalog and our online shop at:

onlineshop.murrelektronik.com

3.2 Connecting

3.2.1 General Line Routing

Cable routing is a very important criterion for interference-free operation of the equipment. When routing cables, be sure to observe the following:

1. Do not route bus cables parallel to high-voltage cables; where applicable, route in separate bundles, or cable troughs, or channels.
2. The FE cable connection must be star-shaped.
3. Prevent potential differences by laying equipotential bonding conductors.
4. The bus cable shield must be attached to the connectors.
5. All analog signals should be carried by shielded cable.
6. Signal and power supply cables to the module should be sufficiently long to prevent pull stresses on the terminal socket

3.2.2 Preventing Interference Voltage

The following points must be observed in order to reduce or prevent voltage interference when setting up a system:

1. Shielding devices and cables where stipulated (VDE 0113 and VDE 0829 etc.),
2. Suitable location of the devices and cables.
3. Take appropriate interference suppression measures for devices emitting interference (e.g. frequency transformers, valves, contactors etc.).
4. Make sure that device and shield grounding methods are massive and comprehensive.

3.2.3 Connecting the EtherCAT Bus

Cables

A D-coded 4-pin M12 cable is required to connect EtherCAT bus users.

We recommend the use of out preterminated Ethernet CAT 5 cables which are simple and reliable to install.

Please refer to the chapter on Accessories.

Connecting to IMPACT67

1. Mounting the IMPACT67 module.
2. Connect function ground to FE terminal on housing.
3. Connect incoming bus cables.
4. Connect any outgoing bus cable.

Pin assignment for bus terminal M12, 4-pin (D-coded)

Socket PORT1 		Socket PORT2
TD +	**Pin 1**	TD +
RD +	**Pin 2**	RD +
TD -	**Pin 3**	TD -
RD -	**Pin 4**	RD -
n.c.	**Pin 5**	n.c.
	Gewinde Thread Filet Rosca Filetto Rosca	

Tab. 16: Bus connector pin assignment

3.2.4 Power Supplies

We recommend the use of primary switched-mode power supplies in applications with the IMPACT67 and to supply the sensors and actuators.

IMPACT67 modules require a DC power supply in the range 18 to 30 V.

System-related limit values regarding system power supply must be strictly observed if maximum functional safety and fault-free operation are to be ensured.

Always ensure that the system power, measured at the device furthest from the power supply, does not drop below 18 VDC.

A load current-related voltage drop in the power supply cable occurs due to the central power supply of IMPACT67 modules, including all their connected sensors.

In critical cases, voltage drop optimization is obtainable by changing the location of the power supply unit within the overall system and by using power supply cables with a larger conductor cross-section.

Calculating the required conductor cross-sections is dependent on installation-specific configuration data and is therefore not discussed in this manual.

The power supply module may be damaged if power supply is polarity-reversed. For this reason, we recommend the use of our preterminated 7/8" cables.

3.2.4.1 Connecting the Power Supply to the Module

The auxiliary power is required to power the actuators and sensors. The electronics of the IMPACT67 are powered from the sensor power supply.

The 7/8“ connector is designed to carry a maximum current of 9 A per pin. This is taken into account when connecting the power supply to another circuit.

Power Supply Line

Module supply cables must have VDE approval and a maximum core cross-section of 1.5 mm². All further power supply line characteristics depend on individual applications and are not covered in this manual.

The maximum permitted core cross-section is 1.5 mm².

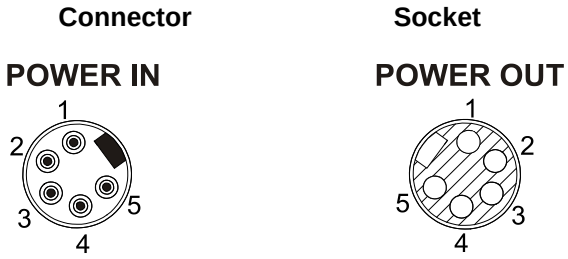
Connecting to IMPACT67

1. Mount the IMPACT67 module.
2. Attach function ground cable to IMPACT67 module.
3. Connect sensor/actuator level.
4. Hook up bus connection.
5. Connect power supply.

Never switch off the sensor power supply (Pin 4) at the power supply connector in service and do not route via the emergency off circuits. Otherwise, the IMPACT67 module can no longer participate in bus communication. Therefore, the module electronics, the entire I/O section, and the sensors are powered via Pin 4.

The actuator power supply (Pin 5) may be designed for EMERGENCY OFF circuits.

Pin assignment of 5-pin power plug 7/8" (mini style)



0V	**Pin 1**	0V
0V	**Pin 2**	0V
⏚	**Pin 3**	⏚
+24V U_S / max. 9 A	**Pin 4**	+24V U_S / max. 9 A
+24V U_A / max. 9 A	**Pin 5**	+24V U_A / max. 9 A

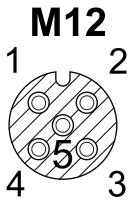
Tab. 17: Pin assignment of power plug 7/8" (mini style)

3.2.5 Connecting Sensors and Actuators

3.2.5.1 Connecting Sensors

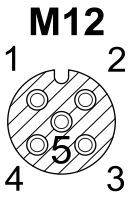
The table below lists all the general pin assignments for the M12 socket slots

Pin 1	+ 24 V	Sensor supply
Pin 2	Function channel	Channel
Pin 3	0 V	Reference potential
Pin 4	Function channel	Channel
Pin 5	⏚	Function ground



Tab. 18: General pin assignment of M12 slots

3.2.5.1.1. IMPACT67 EC DI16



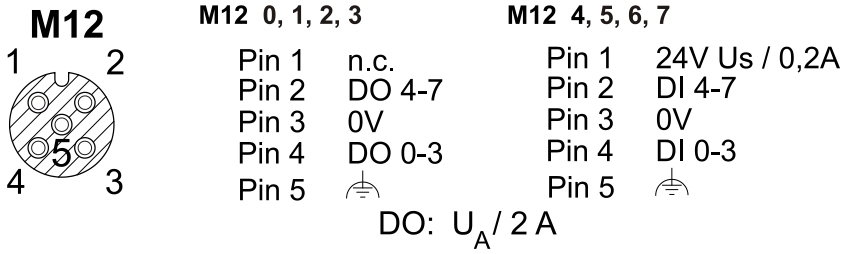
Pin 1 +24V Us / 0,2A
Pin 2 DI 10-17
Pin 3 0V
Pin 4 DI 0-7
Pin 5 ⏚

The table below lists the assignment between M12 slots and I/O labels.

M12 slot	Channel (Pin 4)	Channel (Pin 2)
0	DI 00	DI 10
1	DI 01	DI 11
2	DI 02	DI 12
3	DI 03	DI 13
4	DI 04	DI 14
5	DI 05	DI 15
6	DI 06	DI 16
7	DI 07	DI 17

Tab. 19: M12 slots to I/O labels

3.2.5.1.2. IMPACT67 EC DI8 DO8



The table below lists the assignment between M12 slots and I/O labels.

M12 slot	Channel (Pin 4)	Channel (Pin 2)
0	DO 00	DO 04
1	DO 01	DO 05
2	DO 02	DO 06
3	DO 03	DO 07
4	DI 00	DI 04
5	DI 01	DI 05
6	DI 02	DI 06
7	DI 03	DI 07

Tab. 20: M12 slots to I/O labels

3.2.5.1.3. Sensor Power Supply

Sensors can be powered directly via pins 1 (+24 V) and 3 (0 V) of the M12 sockets. The sensor power supply is protected per M12 slot. This protection is always self-resetting. The maximum current for the sensor power supply is 200 mA per M12 slot. Note the derating in the drawing below:

Derating Sensor Power Supply

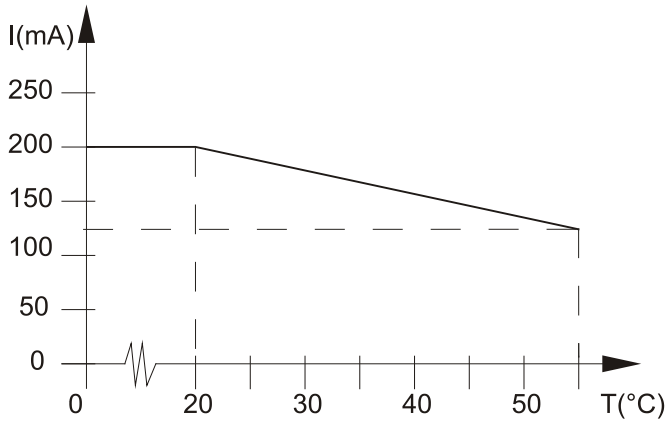


Fig. 8: Derating sensor power supply

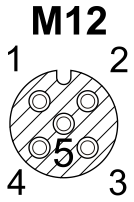
IMPACT67 modules may be loaded to max. 200 mA per M12 slot (sensor current).

If an M12 slot (I/O channel) is not used, it must be fitted with an M12 blank plug in compliance with IP 67 specifications.

3.2.5.2 Connecting Actuators

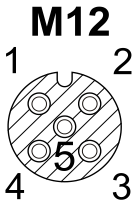
The table below lists all the general pin assignments for the M12 socket slots

Pin 1	n.c.	not connected
Pin 2	Function channel	Channel
Pin 3	0 V	Reference potential
Pin 4	Function channel	Channel
Pin 5	⏚	Function ground



Tab. 21: General pin assignment of M12 slots

3.2.5.2.1. IMPACT67 EC DO16



Pin 1 n.c.
Pin 2 DO 10-17
Pin 3 0V
Pin 4 DO 0-7
Pin 5 ⏚

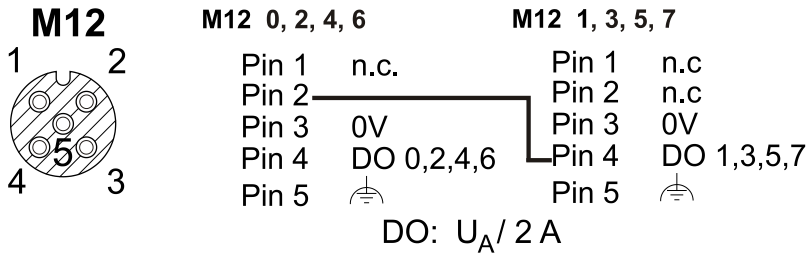
DO: U_A/ 0,5 A

The table below lists the assignment between M12 slots and I/O labels.

M12 slot	Channel (Pin 4)	Channel (Pin 2)
0	DO 00	DO 10
1	DO 01	DO 11
2	DO 02	DO 12
3	DO 03	DO 13
4	DO 04	DO 14
5	DO 05	DO 15
6	DO 06	DO 16
7	DO 07	DO 17

Tab. 22: M12 slots to I/O labels

3.2.5.2.2. IMPACT67 EC DO8



The table below lists the assignment between M12 slots and I/O labels.

M12 slot	Channel (Pin 4)	Channel (Pin 2)
0	DO 00	DO 01
1	DO 01	-
2	DO 02	DO 03
3	DO 03	-
4	DO 04	DO 05
5	DO 05	-
6	DO 06	DO 07
7	DO 07	-

Tab. 23: M12 slots to I/O labels

3.2.5.2.3. Actuators

Each output of the DO8 and DI8/DO8 variants is loadable to max. 2 A.

Each output of the DO16 variant is loadable to max. 0.5 A.

The total current may not exceed 9 A due to the maximum current carrying capacity of the 7/8“ power connector.

The module may heat up depending on the load.

If an output channel detects an overload or a short-circuit, the output is shut down.

To reset the output, it must first be reset using the control software.

Outputs are reset by an actuator power supply reset.

In order to achieve rapid short-circuit cutoff times, we recommend not to exceed the following lengths:

max. 15 m feed line (POWER IN) 1.5 mm² and max. 1.5 m actuator line 0.75 mm²

max. 10 m feed line (POWER IN) 1.5 mm² and max. 3 m actuator line 0.75 mm²

3.2.6 Unused Connections

Unused sockets must be closed off with blank plugs. Otherwise, IP 67 protection is not guaranteed.

4. Startup

4.1 ESI (EtherCAT Slave Information)

The IMPACT 67-EC ESI (Murrelektronik IMPACT67.xml) is a configuration file in XML format.

The latest XML files are retrievable over the web from:
http://www.murrelektronik.com in the service section under / Technical Data.

Please make sure you use the correct configuration file. It is dependent on the software version of the IMPACT67 Module:

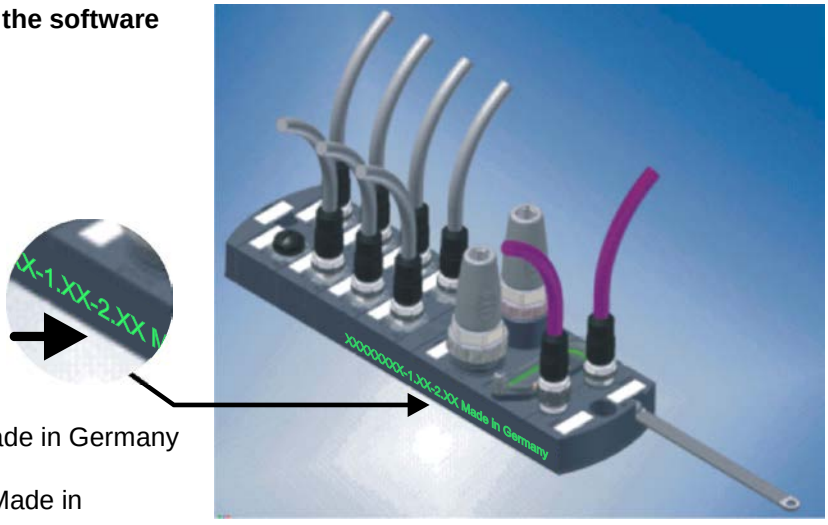
The configuration file for software versions lower than 2.00 is:

Murrelektronik IMPACT67.xml Version 1.0.

The configuration file for software versions higher than 2.00 is:

Murrelektronik IMPACT67.xml Version 3.0.

This figure shows where the software version is located (SW):



XXXXXXXX-1.XX-**2.XX** Made in Germany

Production code HW-**SW** Made in

4.2 Configuration

4.2.1 Example: Integrating an IMPACT67 Device in a TwinCAT® control unit

The section below describes an example of simply integrating and putting into service an IMPACT67 EC device in a TwinCAT® control unit.

First connect the IMPACT67 EC module to your control unit and add it to an existing project or create a new project as described in the manufacturer's instructions:

1. Copy the IMPACT67 EC ESI to the TwinCAT® folder in which the other ESI files are located (as default, you will find them under /Programme/TwinCAT/IO/EtherCAT).

2. Open the TwinCAT® System Manager.

3. Create a new project, if necessary, and insert your I/O device (Ethernet card) in the new project.

4. Right-click on your I/O device to scan all the connected EtherCAT slaves (boxes).

On the left side, you will then find the associated IMPACT67 EtherCAT module:

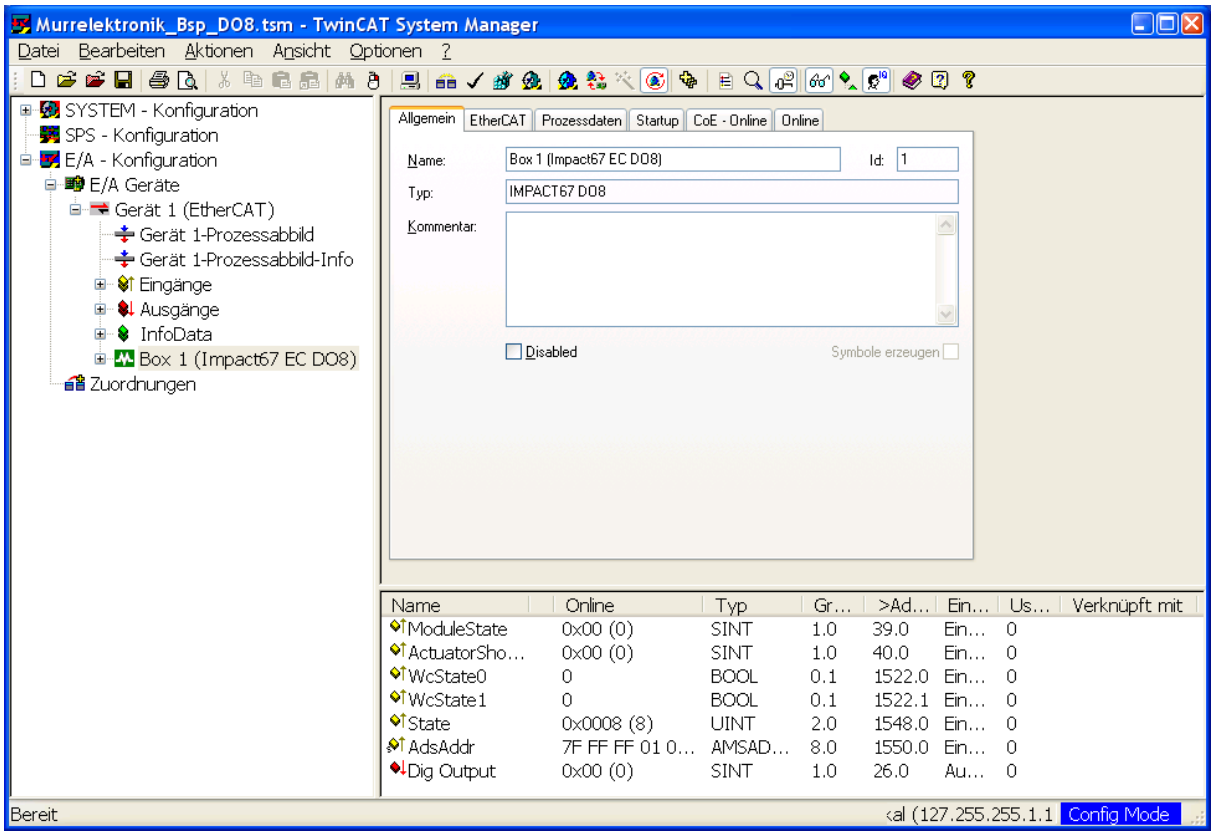

Murrelektronik_Bsp_DO8.tsm - TwinCAT System Manager
Datei Bearbeiten Aktionen Ansicht Optionen ?
SYSTEM - Konfiguration
SPS - Konfiguration
E/A - Konfiguration
E/A Geräte
Gerät 1 (EtherCAT)
Gerät 1-Prozessabbild
Gerät 1-Prozessabbild-Info
Eingänge
Ausgänge
InfoData
Box 1 (Impact67 EC DO8)
Zuordnungen
Allgemein EtherCAT Prozessdaten Startup CoE - Online Online
Name: Box 1 (Impact67 EC DO8) Id: 1
Typ: IMPACT67 DO8
Kommentar:
Disabled
Symbole erzeugen
Name Online Typ Gr... >Ad... Ein... Us... Verknüpft mit
ModuleState 0x00 (0) SINT 1.0 39.0 Ein... 0
ActuatorSho... 0x00 (0) SINT 1.0 40.0 Ein... 0
WcState0 0 BOOL 0.1 1522.0 Ein... 0
WcState1 0 BOOL 0.1 1522.1 Ein... 0
State 0x0008 (8) UINT 2.0 1548.0 Ein... 0
AdsAddr 7F FF FF 01 0... AMSAD... 8.0 1550.0 Ein... 0
Dig Output 0x00 (0) SINT 1.0 26.0 Au... 0
Bereit
Config Mode

Fig. 9: IMPACT67 EtherCAT module

4.2.1.1 Parameterizing Input Filters (DI8/DO8 and DI16 only)

IMPACT67 modules offer you the opportunity to select from 4 different filters for input signals:

0. ~1 ms (default)
1. ~250 µs
2. ~500 µs
3. ~1 ms
4. ~3 ms

In order to be clearly detected, a stable gHigh signal must be present for at least the time you selected.

The 1 ms filter is activated as default after the modules are switched on. To select another filter, transfer a value corresponding to filters using the CoE index 2000_{hex}. Refer to the table below for this value:

CoE-Index 2000_{hex}	Value	Filter time
	0	1 ms
	1	250 µs
	2	500 µs
	3	1 ms
	4	3 ms

Tab. 24: Filter selection

Transferring Filters using CoE Online (also possible in service)

1. Choose the module you want to parameterize from the left of TwinCAT.
2. Select the CoE Online tab from the right.
3. Expand the Index 2000 by clicking on the + symbol.
4. Double-click to transfer the required value to the module.

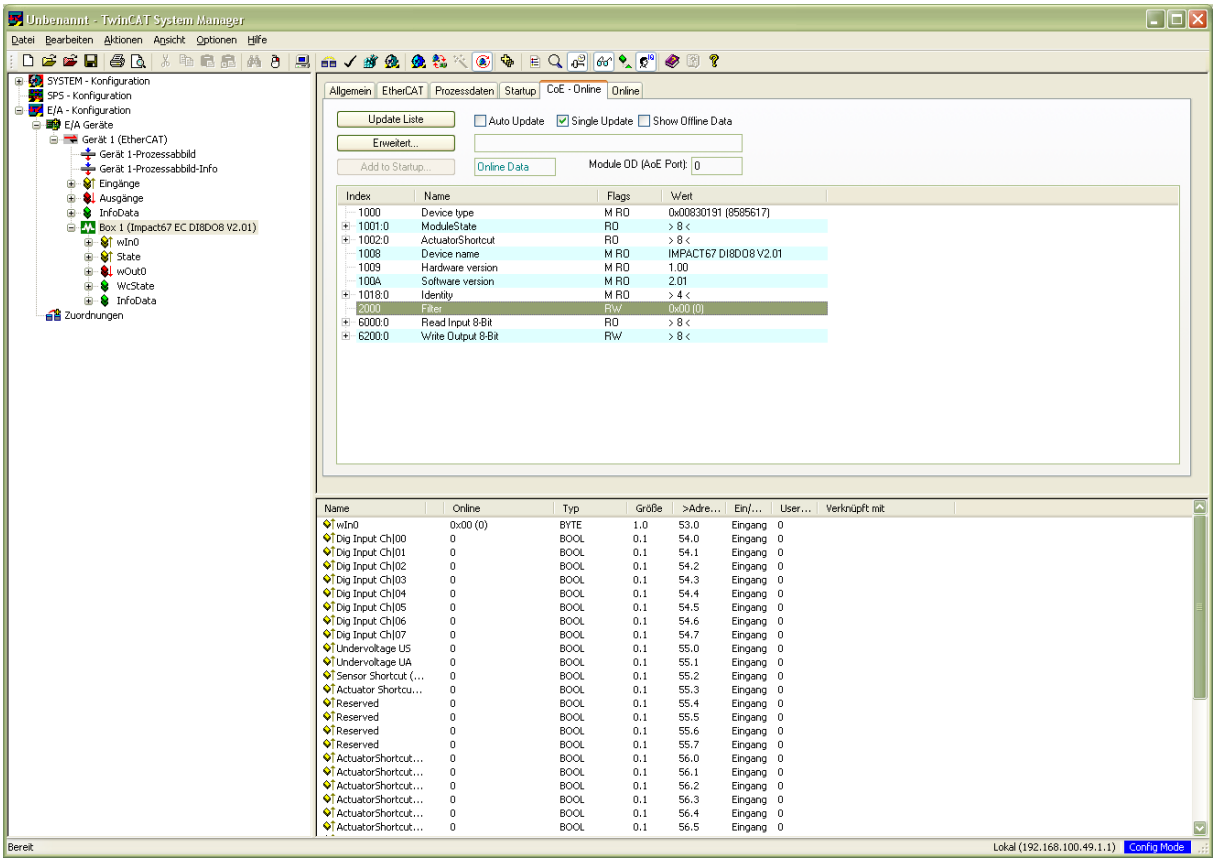


Fig. 10: Transferring filters using CoE online

Transferring filters during module startup (parameters are transferred when the module is logged on to the bus)

1. Choose the module you want to parameterize from the left of TwinCAT.
2. Select the Startup tab from the right.
3. Click on the New... button.
4. In the input field "Data", write the required value (please enter the leading zero).
5. Under "Transition", tick the checkboxes I->P and S->p .
6. Close the box by clicking on OK.
7. Restart the module and the controller to accept the filter.

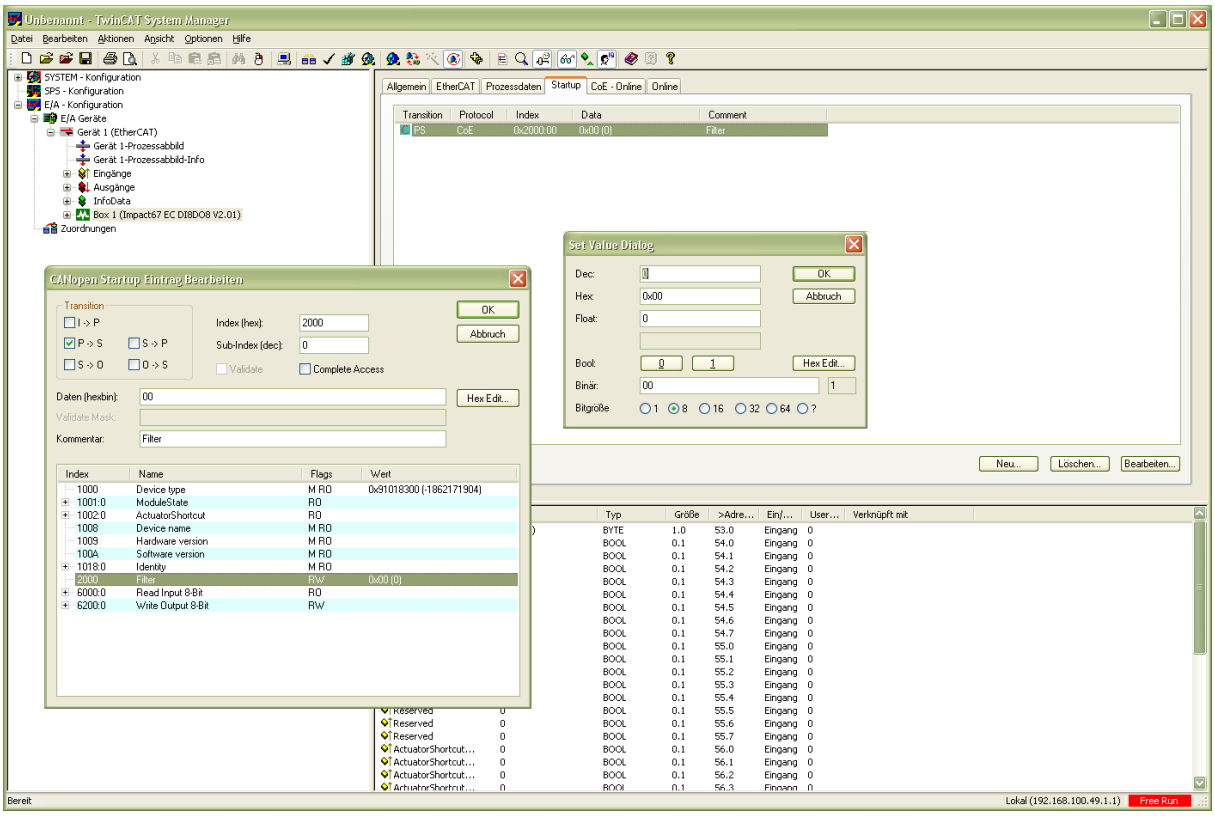


Fig. 11: Transferring filters during module startup

4.2.2 IMPACT67-Related Variable Names

"State"	Contains the variable module state and, if necessary ActuatorShortcut (not IMPACT67 DI16-EC, 55081). Accordingly, you will find all diagnostic data here.
"Modulestate"	This 8-bit variable contains the module diagnostic for undervoltage, sensor short-circuit, and actuator short-circuit (only device-related).
"ActuatorShortcut"	Only for 55082 (DI8/DO8), 55084 (DO16) each 16 bits long, and 55083 (DO8) with a length of 8 bits. The variable contains the exact channel diagnostic for actuator short-circuits.
wOut	Contains the DigOutput variable.
DigOutput	55082 (DI8/DO) and 555083 (DO8): 8-bit output variable 55084 (DO16): 16-bit output variable
wOut	Contains the DigInput variable.
DigInput	55081 (DI16): 16-bit input variable 55082 (DI8/DO8): 8-bit input variable

4.3 Startup With An OMRON PLC And Sysmac Studio Software

1. Copy the relevant ESI files to the folder

   OMRON\Sysmac Studio\IODeviceProfiles\EsiFiles\UserEsiFiles

2. Start the ***Sysmac Studio*** software.
3. Click ***New project***.

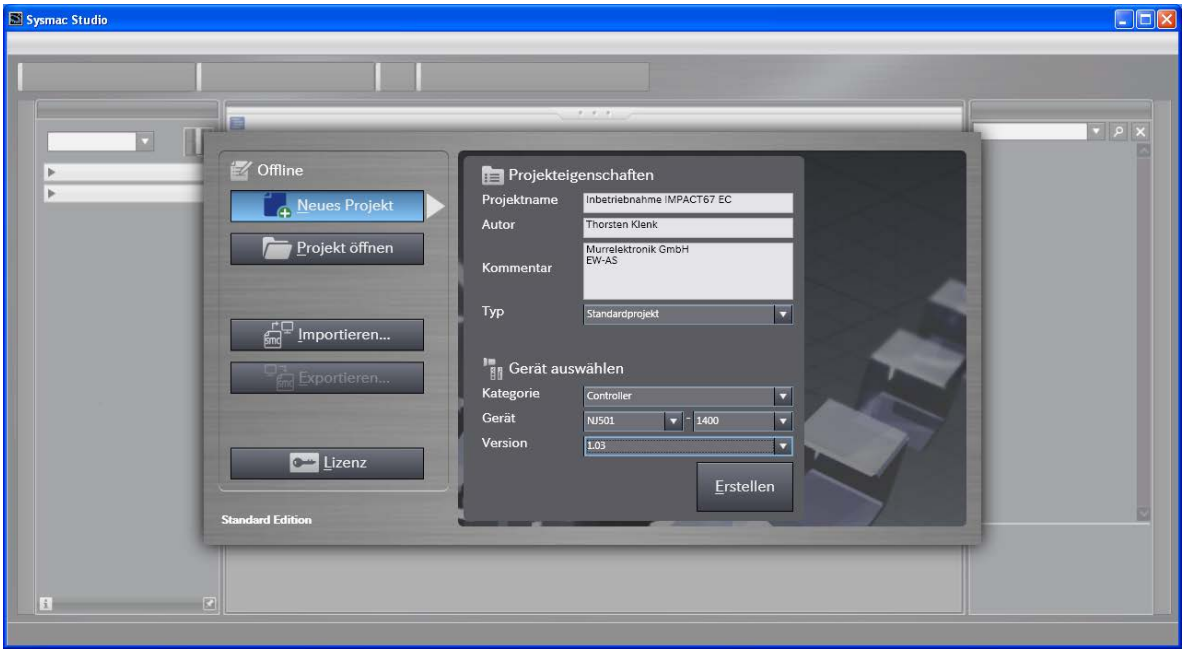


Fig. 12: Sysmac Studio: Create a new project

4.3.1 Manual Configuration

Change manufacturer to Murrelektronik

1. Double-click **EtherCAT** in the left window.
2. In the right window under Groups, change the option from ***All manufacturers*** to ***Murrelektronik GmbH***.

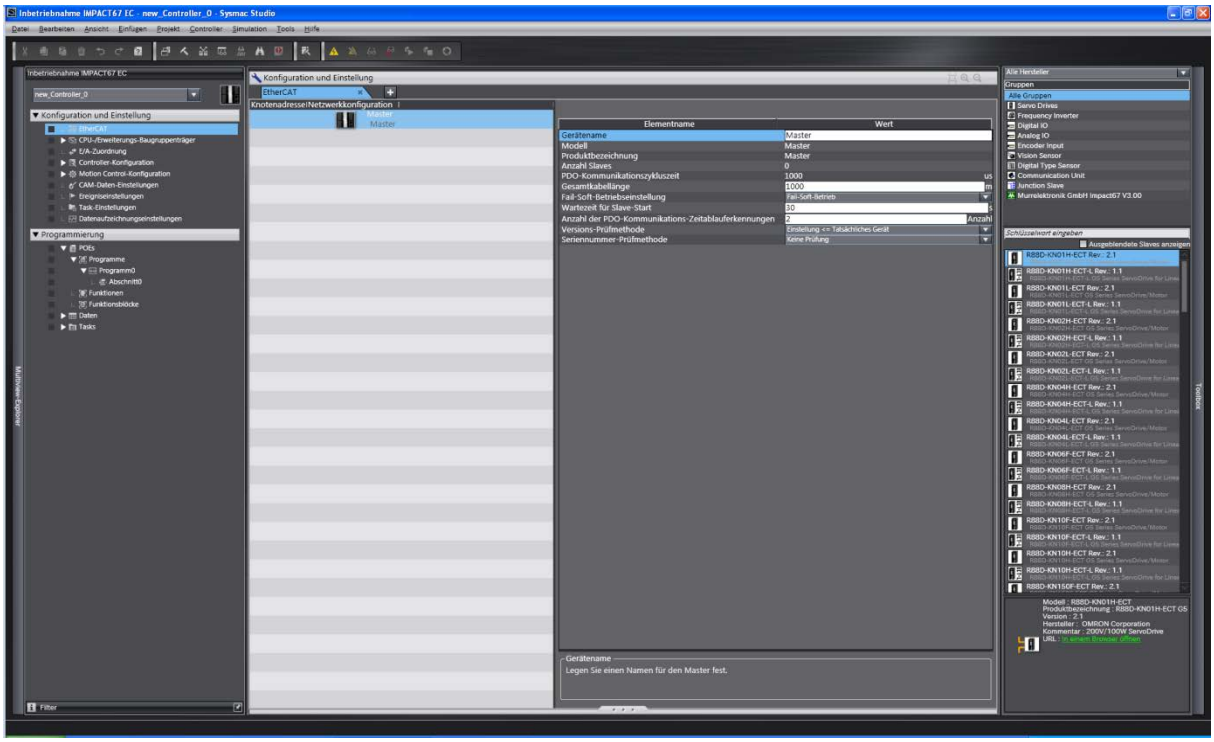


*Fig. 13: View after double-click on **EtherCAT**.*

Add modules

When adding modules, make sure the modules are in the correct order so that the software can detect them.

1. Drag and drop the EtherCAT modules in the correct order from the selection list to the Ether-CAT field.

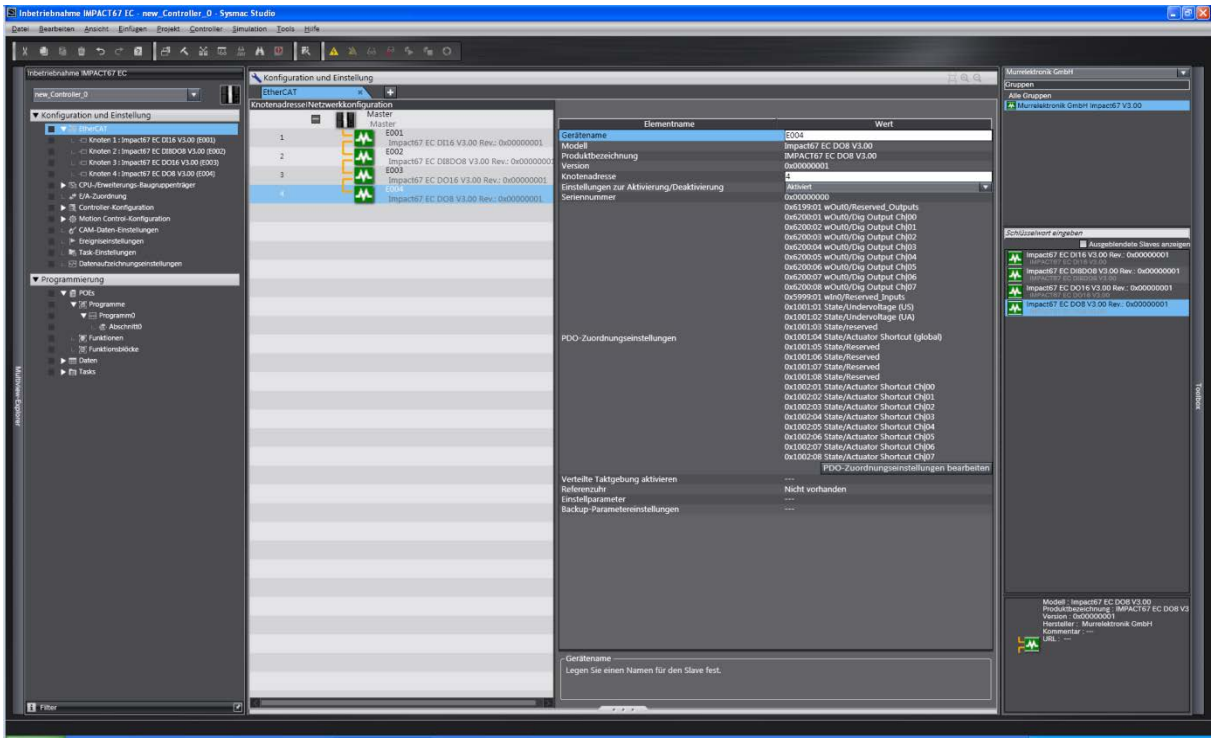


Fig. 14: View after adding modules

Issue the DEVICE ID

The address issued here must be identical with the DEVICE ID set by the rotary switches on the module.

1. Click the EtherCAT module icon.

Its elements and parameters are displayed on the right.

2. Specify the node address in the selection.

The Device ID is saved and the system is configured.

3. Repeat steps 1 and 2 for all modules.

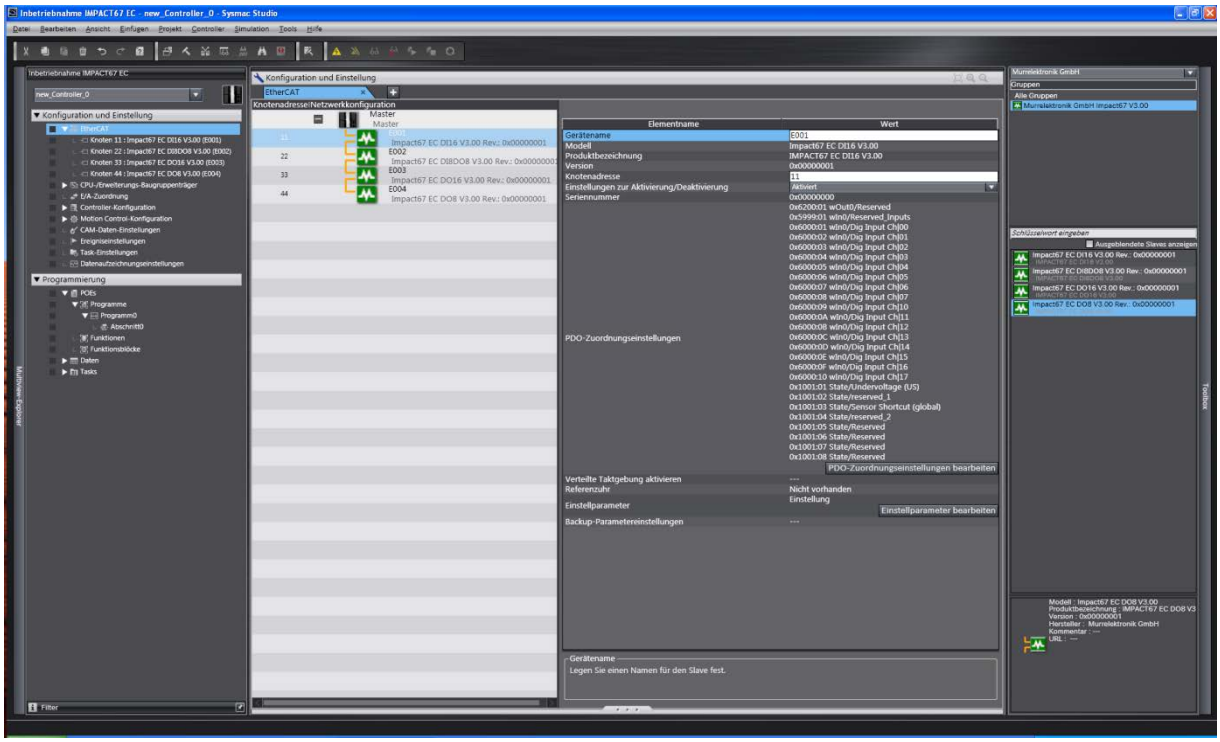


Fig. 15: View after changing the node address

4.3.2 Scan In Configuration

Requirements

- The system is installed completely.
- All devices are powered.
- The Fieldbus cables are all connected up.

Merge network configuration

1. Click the ***Online*** icon . Set up an online link to the PLC.
2. Right-click the Master.
3. In the shortcut menu, mark "Compare and merge actual network configuration“.

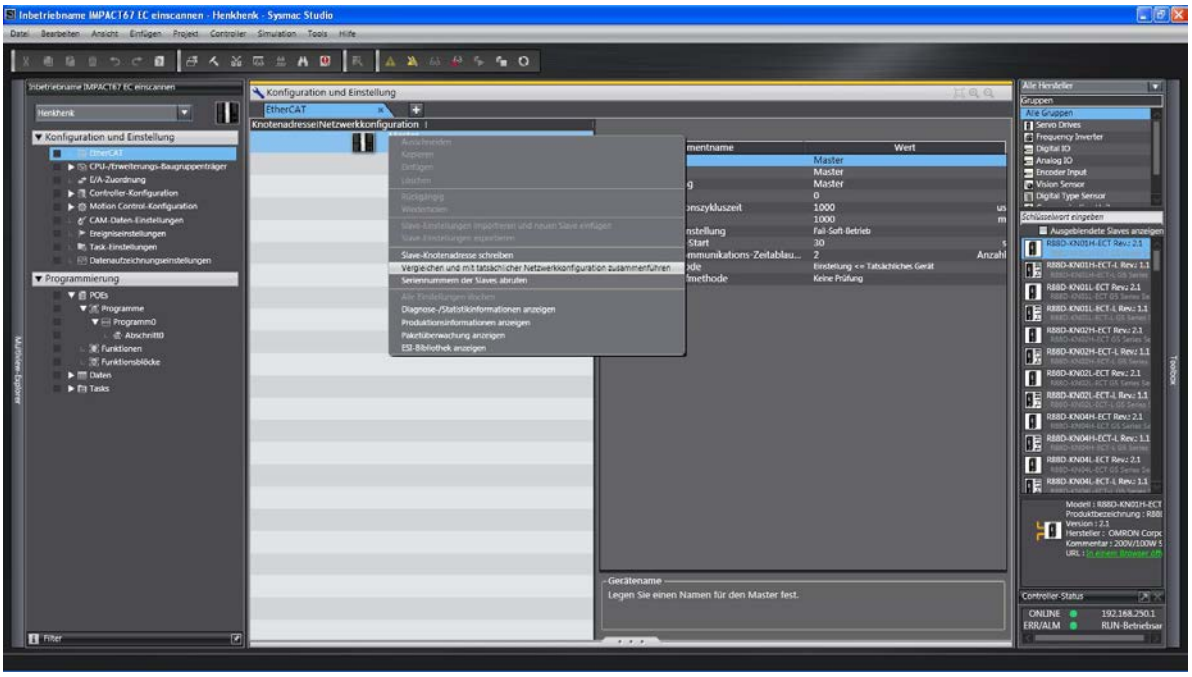


Fig. 16: Select ***Compare and merge actual network configuration.***

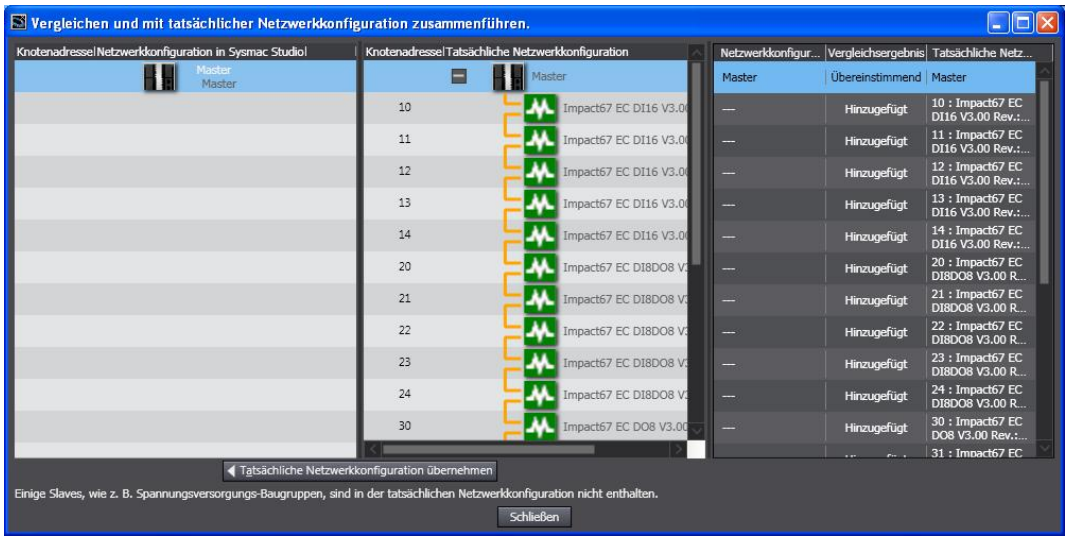


*Fig. 17: View after clicking **Compare…***

Accept actual network configuration

1. Click ***Accept actual network configuration***.
2. Close the window.
3. Click the ***Offline*** icon .
4. Then parameterize the module input filters with digital inputs, if required.

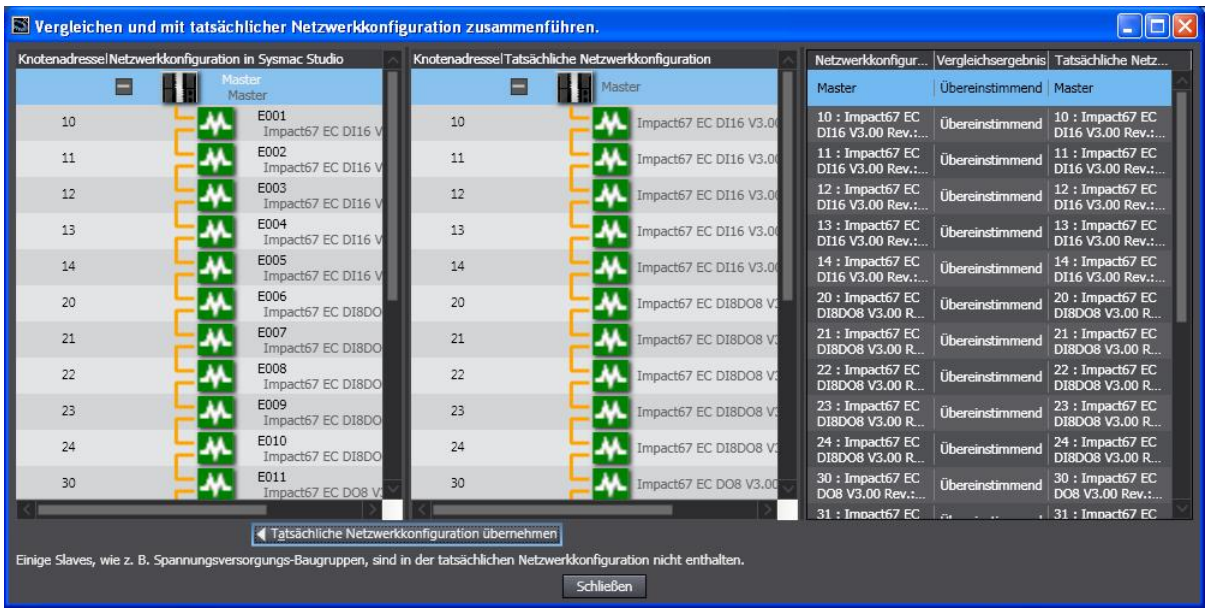


*Fig. 18: Window after clicking **Accept actual network configuration**.*

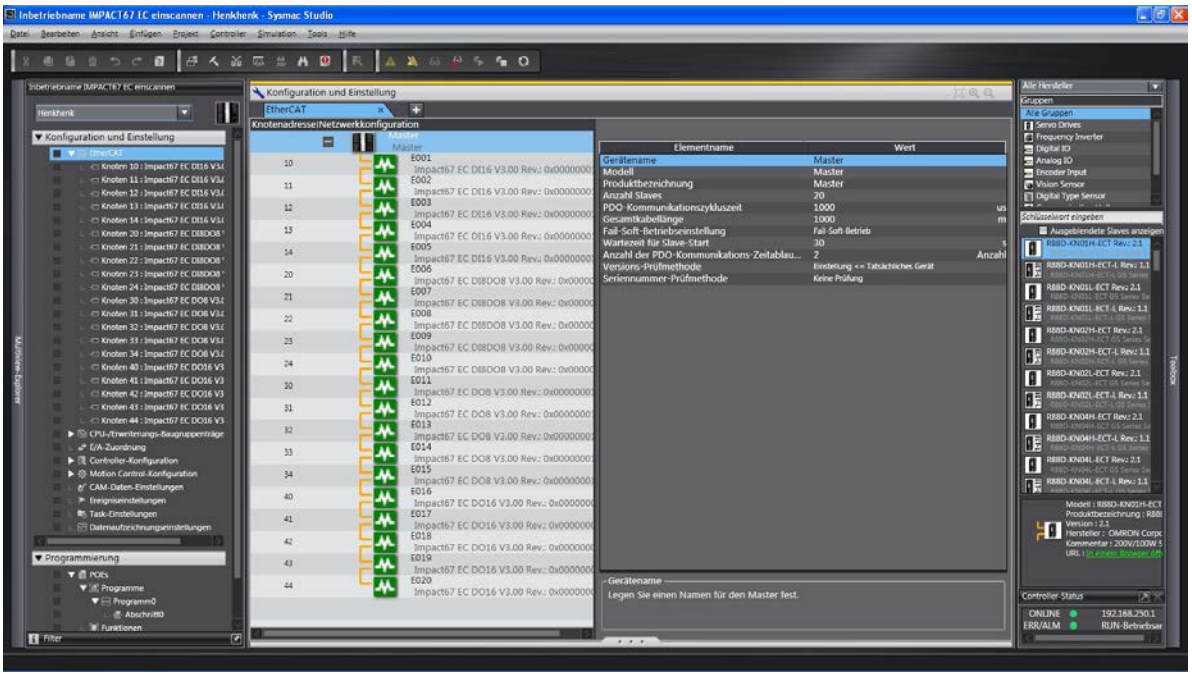


*Fig. 19: Current view of **Configuration and Setting***

4.3.3 Parameterizing the Input Filters (DI8/DO8 and DI16 only)

IMPACT67 modules with inputs offer you the opportunity to select from 4 different filters for input signals:

In order to be clearly detected, a stable High signal must be present for at least the time you selected.

The 1 ms filter is activated as default after the modules are switched on. To select a different filter, transfer a parameter corresponding to the filters using the CoE Index 2000_{hex}. Use the parameters in the table below:

CoE Index 2000_{hex}	Parameter	Filter Time
	0	1 ms
	1	250 µs
	2	500 µs
	3	1 ms
	4	3 ms

Tab. 25: Filter selection

Edit setting parameters

1. Mark the module you want to edit.
2. Click ***Edit setting parameters*** (see Abb. 19:).
3. Enter the required value in the field for the filter.
4. Click ***OK***.

The input filter is saved.

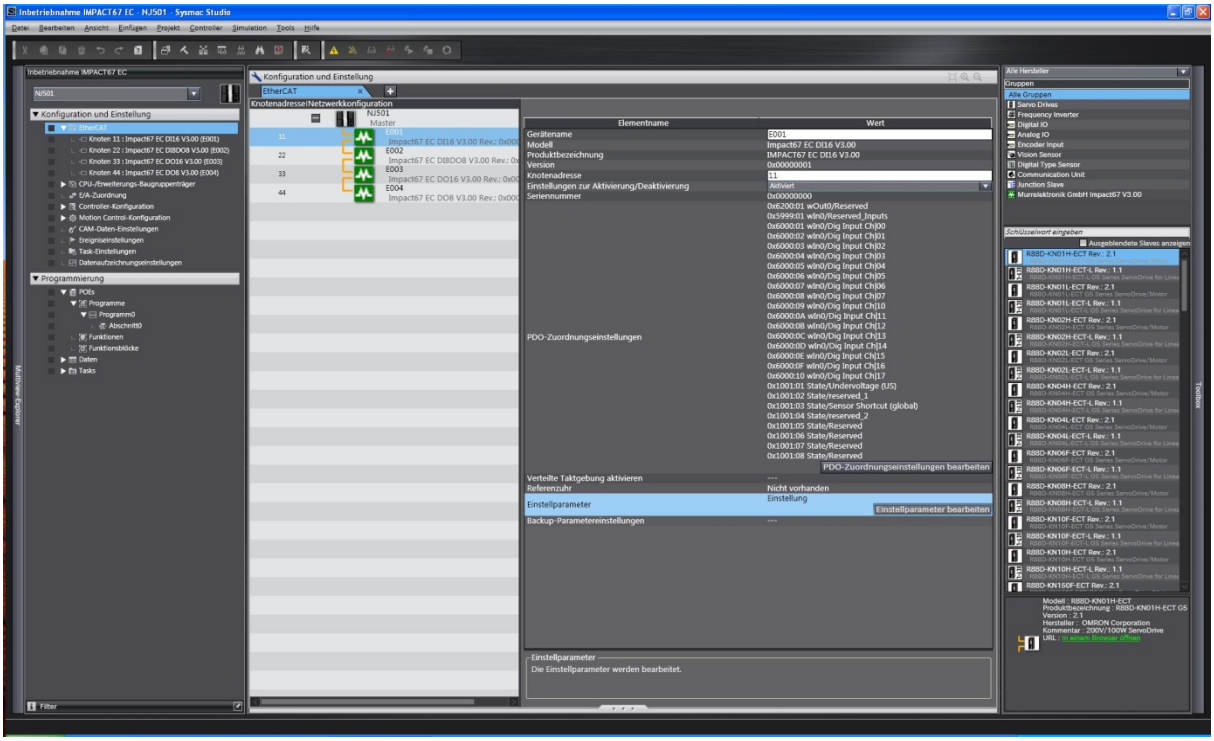


Fig. 20: Edit setting parameters

5. Mapping I/O Data

5.1 Byte Distribution

Header modules	Number of output bytes	Number of input bytes	
		I/O	Diagnos-tic
IMPACT67 EC DI16, 55081	0	2 bytes	1 byte
IMPACT67 EC DI8/DO8, 55082	1 byte	1 byte	3 bytes
IMPACT67 EC DO8, 55083	1 byte	0	2 bytes
IMPACT67 EC DO16, 55084	2 bytes	0	3 bytes

5.2 Relationship between Channel Number and Pin/Socket

Based on the channel number, you can define the socket and the associated pin. Example: Channel number is 12, this corresponds to Pin 2 (x=1) of Socket No. 2 (Y=2).

Channel number = XY	X	Y
X = 0	Pin 4	
X = 1	Pin 2	
Y = 0 to (number of sockets)		Number of sockets

5.3 Bit Assignment

5.3.1 Bit assignment for DO8 (Art.No.: 55083) / DI16 (Art.No.: 55081) / DO16 (Art.No.: 55084)

Bit assignment Byte 0: relevant for DO8, DI16, DO16

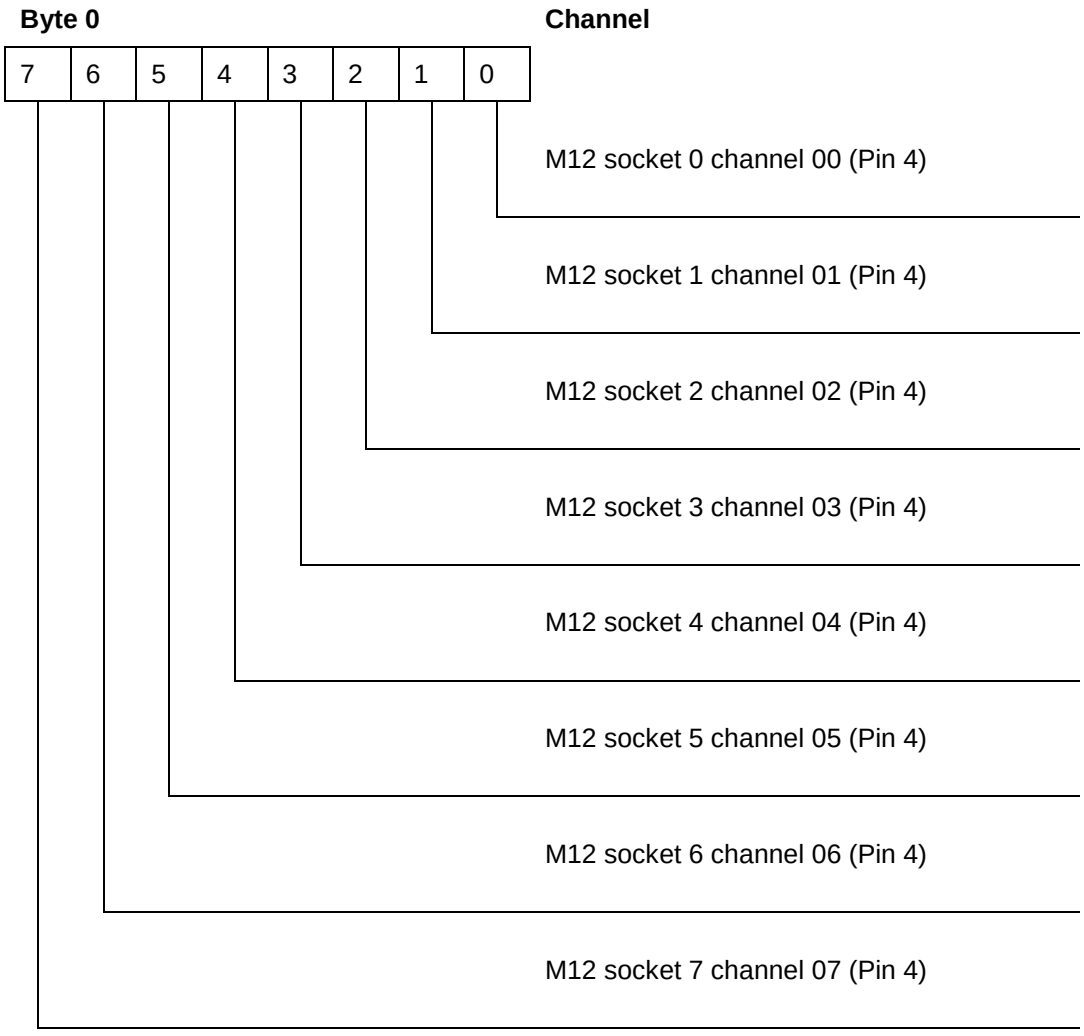


*Fig. 21: **Bit assignment Byte** 0: relevant for DO8, DI16, DO16*

Bit assignment Byte 1: relevant for DI16, DO16

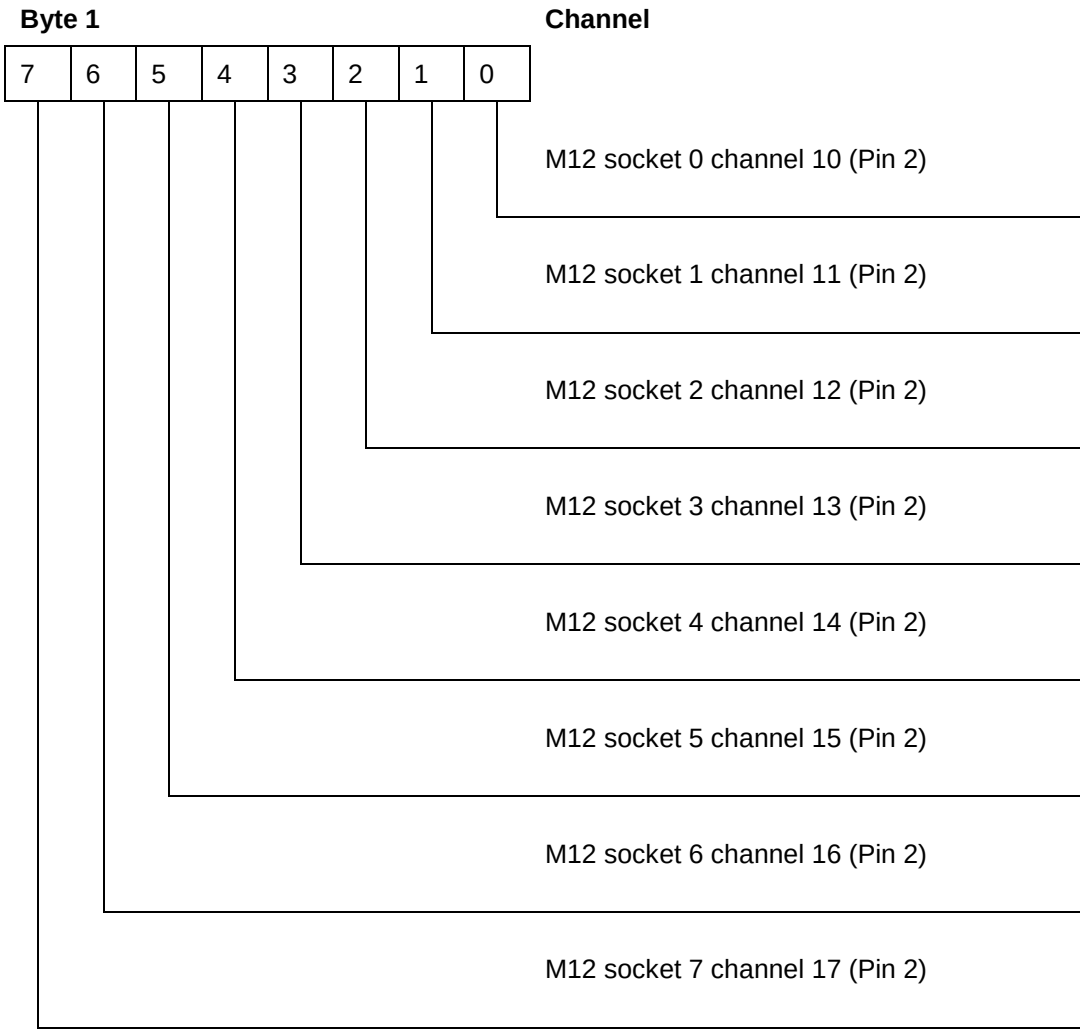


Fig. 22: Bit assignment Byte 1: relevant for DO16, DI16

5.3.2 Bit assignment for DI8 DO8 (Art.No.: 55082)

Bit assignment Byte 0: Outputs

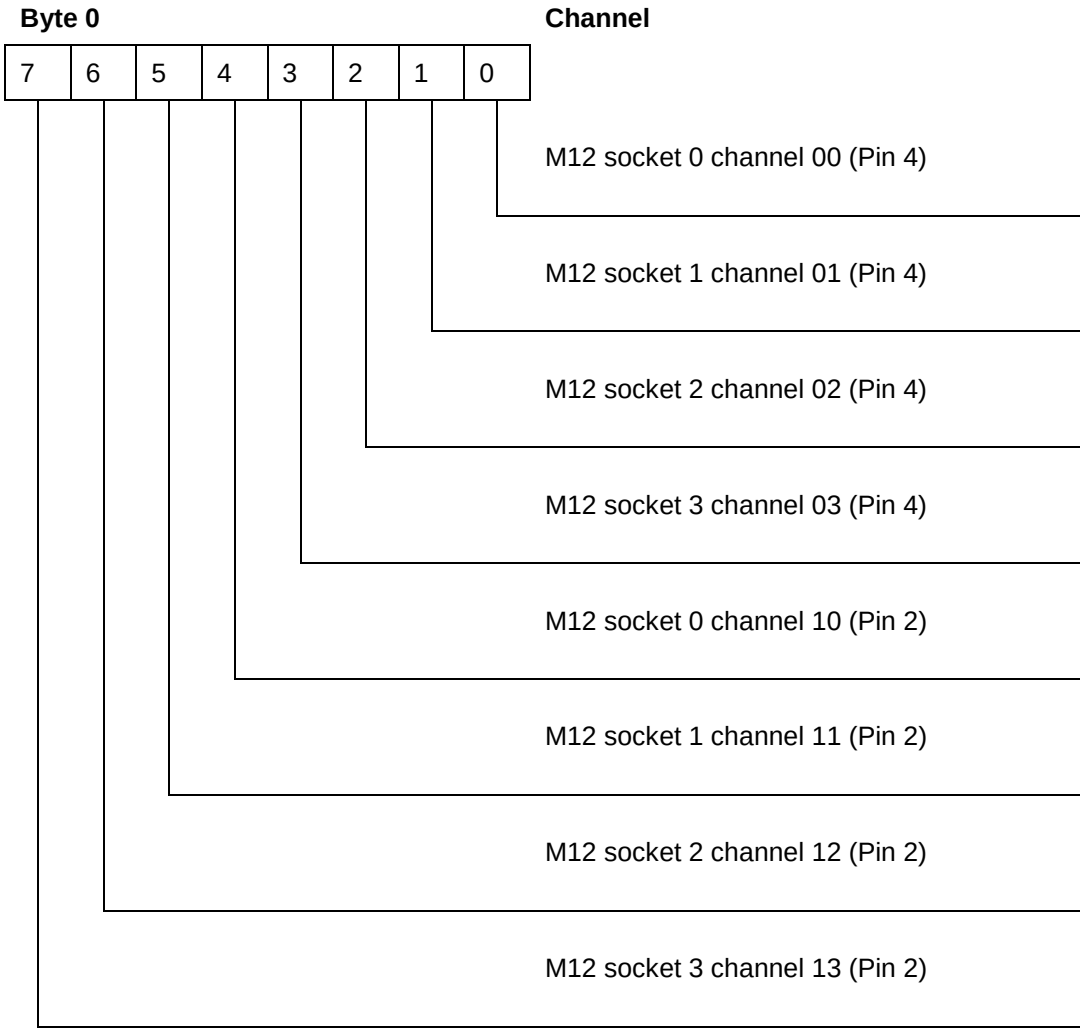


Fig. 23: Bit assignment Byte 0: Outputs

Bit assignment Byte 1: Inputs

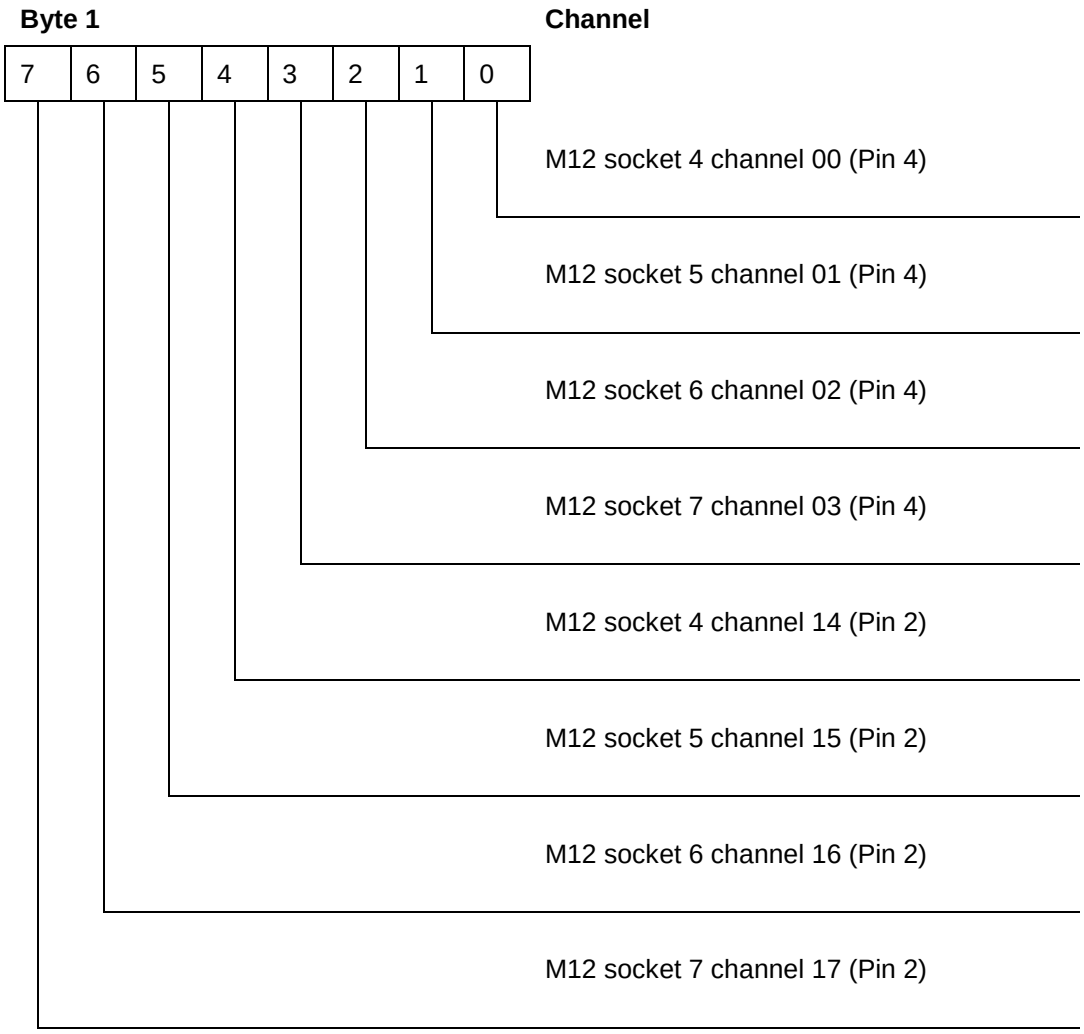


Fig. 24: Bit assignment Byte 1: ***Inputs***

6. Diagnosis

Diagnostic information is an important basis for easy setup and quick troubleshooting.

Clear information from the I/O module and its connected periphery components, such as sensors and actuators, identify, rectify, and therefore minimize downtimes.

6.1 LED Displays

All modules of the IMPACT67 series have separate and clearly arranged displays for bus status, device status, and I/O status. These displays are located on the front of the device.

6.1.1 Bus and Device Status LEDs

The LEDs on the front of the module are clearly marked for identification. Display is provided by LEDs that light up permanently or flash. The figure below depicts LED layout and the table lists the functions.

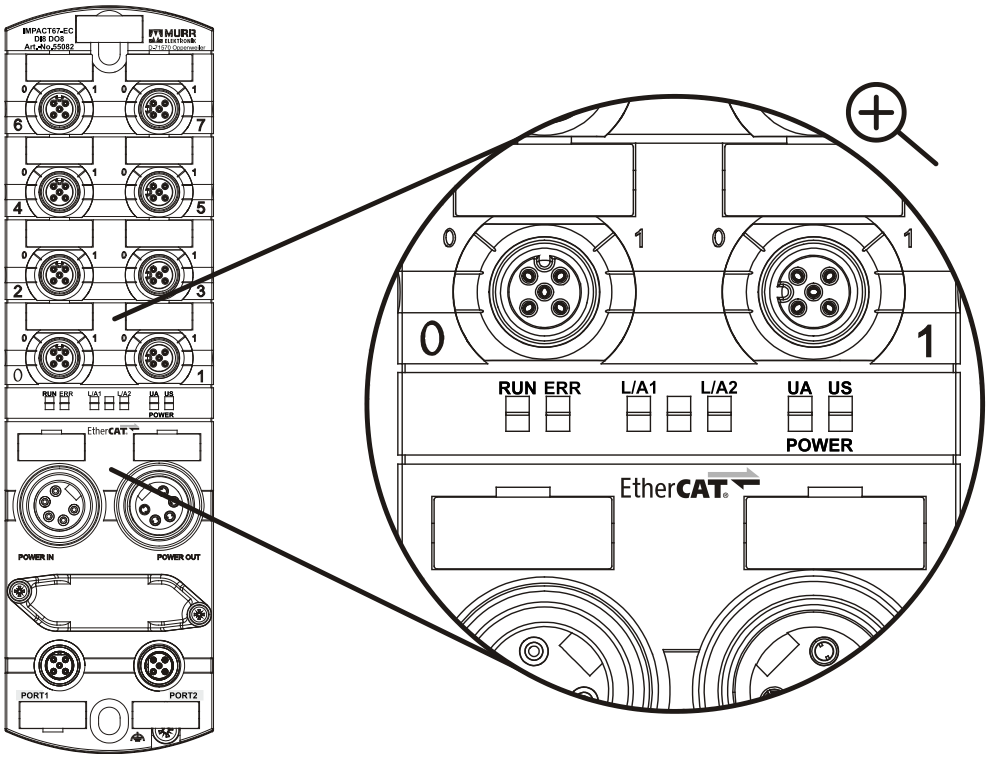


Fig. 25: Bus and device status LEDs on the module front panel

Function of bus and device status LEDs on the device front panel

Name	LED	Status	Description
ERROR (red)	off	No error	Device operating normally (Device OK)
	Single flash	Unsolicited State Change	Slave changed the EtherCAT status. The "Change" parameter in the AL status register was set to 01 (change/error).
	Flickering	Booting Error	A booting error was detected.
	Double flash	Application Watchdog Timeout	Watchdog Timeout occurred.
	Triple flash	Reserved	Reserved
	On	PDI Watchdog Timeout	PDI Watchdog Timeout occurred.
RUN (green)	Flickering	INITIALIZATION or BOOTSTRAP	Device boots and has not yet reached INIT state.
	Single flash	SAFE-OPERATIONAL	Device in SAFE-OPERATIONAL state
	Blinking	Pre-Operational	The device is in PRE-OPERATIONAL state
	On	Operational	The device is in OPERATIONAL state
	off	INIT	Device in INIT mode.
L/A (green)	off	No Link	No link present
	On	Link	Link present, no or defective activity on bus
	Flickering	Activity	Link present, device in data exchange
US POWER (red/green)	off	No power	Failure of module and sensor power supply
	green	Normal function	Module and sensor power supply applied
	red	Undervoltage	Module and sensor power supply undervolt-age
UA POWER (red/green)	off	No power	Failure of actuator power supply
	green	Normal function	Actuator supply OK
	red	Undervoltage	Undervoltage, actuator power supply

Tab. 26: Function of bus and device status LEDs on the device front panel

A distinction is made between the following indicator states:

- LED on: constant on
- LED off: constant off
- LED flickering: On / off phase at a rate of approx. 10 Hz: on for approx. 50 ms and off for approx. 50 ms.
- LED blinking: On / off phase at a rate of approx. 2.5 Hz: on for approx. 200 ms followed by off for approx. 200 ms.
- LED single flash: a single flash (approx. 200 ms) followed by a long off phase (approx. 1000 ms).
- LED double flash: a sequence of two short flashes (approx. 200 ms), the interval between two flashes is approx. 200 ms. This sequence ends with a long off phase (approx. 1000 ms).
- LED triple flash: a sequence of three short flashes (approx. 200 ms), the interval between the three flashes is approx. 200 ms. This sequence ends with a long off phase (approx. 1000 ms).

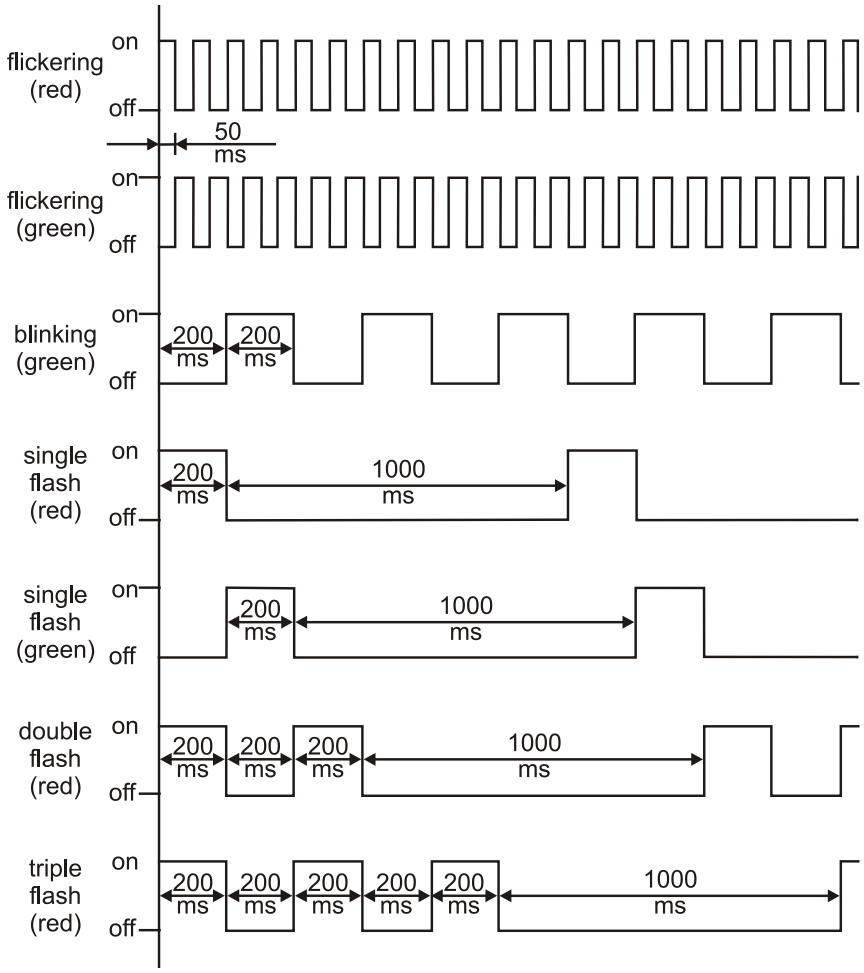
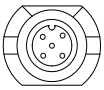
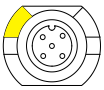


Fig. 26: Status of bus displays and flash rates

6.1.2 I/O Status LEDs at M12 Slots

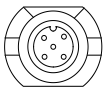
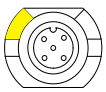
Each input and output is assigned a separate status display They are labeled with '00 to 07' and '10 to 17'. The displays are located directly next to the corresponding M12 socket. This makes it easy to identify the status of peripheral components, such as sensors and actuators.

LED Display of Digital Inputs

Input with NO contact function	Voltage at Input	Logic value	LED Display	
	0 V	0		off
	24 V	1		yellow

Tab. 27: LED display of digital inputs

LED Display of Digital Outputs

Output	Logic value	Voltage at Output	LED Display	
	0	0 V		off
	1	24 V		yellow

Tab. 28: LED display of digital outputs

6.1.3 LED Display for Diagnosis

6.1.3.1 IMPACT67 DI16 Modules

Error	LED at M12 Socket		LED Designation
	Socket No. x		U_S
	Channel 0x	Channel 1x	
Module/sensor power supply undervoltage			red
Short-circuit (sensor supply)	both red		

Tab. 29: LED display for diagnosis

6.1.3.2 IMPACT67 DI8 DO8 modules

Error	LED at M12 Socket		LED Designation	
	Socket No. x		U_A	U_S
	Channel 0x	Channel 1x		
Module/sensor power supply undervoltage				red
Actuator power supply undervoltage			red	
No actuator supply			off	
Deactivate actuator	red	red		
Short-circuit (sensor supply)	both red			

Tab. 30: LED display for diagnosis

6.1.3.3 IMPACT67 DO8 Modules

Error	LED at M12 Socket		LED Designation	
	Socket No. x		U_A	U_S
	Channel 0x	Channel 1x		
Module/sensor power supply undervoltage				red
Actuator power supply undervoltage			red	
No actuator supply			off	
Deactivate actuator	red			

Tab. 31: LED display for diagnosis

6.1.3.4 IMPACT67 DO16 Modules

Error	LED at M12 Socket		LED Designation	
	Socket No. x		U_A	U_S
	Channel 0x	Channel 1x		
Module/sensor power supply undervoltage				red
Actuator power supply undervoltage			red	
No actuator supply			off	
Deactivate actuator	red	red		

Tab. 32: LED display for diagnosis

6.2 Module / Sensor Power Supply

6.2.1 Undervoltage

There are three levels of undervoltage detection :

1. Us < 18 V : In this case the module is still working but:

- The POWER - Us LED lights up red
- The respective diagnostic data are transferred via the bus to the master

2. U_S < 12 V : In this case, the inputs/outputs have failed but bus communication still functions:

- POWER Us LED goes out,

3. Us < 5.5 V : In this case, the device shuts down completely.

6.3 Actuator Power Supply

6.3.1 Undervoltage

There are two levels of undervoltage detection :

1. U_A < 18 V : In this case the module is still working but:

- The POWER U_A LED lights up red
- The respective diagnostic data are transferred to the master

2. U_A < 12 V : In this case, the outputs have failed but bus communication still functions:

- The POWER U_A LED goes out
- All outputs are reset to 0

6.4 Sensor Power Supply

Power supply for the sensors is provided at the M12 sockets between pin 1 (+24V) and Pin 3 (0V).

6.4.1 Short-Circuit or Overload

The sensor power supply is protected by a self-resetting multifuse for each M12 socket. The maximum current draw for the sensor power supply is 200 mA per M12 slot. Note the derating in the drawing below:

Derating Sensor Power Supply

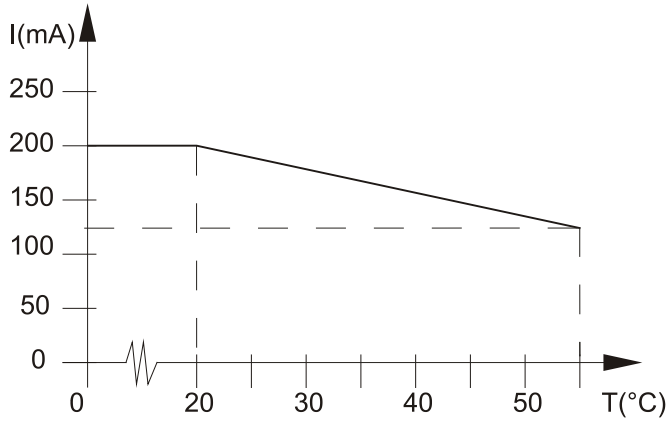


Fig. 27: Derating sensor power supply

In the event of a short-circuit or overload in the sensor supply, the following symptoms are observed on the IMPACT67 module:

- The diagnostic LEDs light up red on the associated M12 socket.
- The respective diagnostic data are transferred over the bus to the master.
- All other inputs function correctly.

When an overload or short-circuit is rectified or the sensor supply is connected, the LEDs and diagnostic data are reset.

6.5 Outputs (Actuators)

6.5.1 Short-Circuit or Overload

In the event of an output short-circuit or overload, the following symptoms are observed on the IMPACT67 module:

- The diagnostic LEDs light up red on the associated M12 socket
- The output status LED extinguishes
- The respective diagnostic data are transferred over the bus to the master.

In order to reactivate an output after a short circuit or overload has been corrected, the following procedure must be observed:

1. The output must first be set to “0”
2. and then to “1” again

Outputs are reset by an actuator power supply reset.

6.6 Diagnostics via the Fieldbus

The following diagnostics are reported:

- Sensor short-circuit group signal
- Actuator shutdown by channel and group signal
- Module / sensor power supply undervoltage (The power supply U_S is lower than 18V)
- Actuator power supply undervoltage (the power supply U_A is lower than 18 V)

With EtherCAT , the diagnostics are sent in separate diagnostic telegrams.

6.6.1 Diagnostics via I/O Data

In the I/O section, access to the diagnostic messages is via Objects 1001H (Module State) and 1002H (ActuatorShortcut, not for IMPACT67-EC DI16 55081). The associated transmit PDO is the Object 1A01 (ErrorState).

Bit assignment in Object 1001H (ModuleState)

This object contains device-related diagnostics. A set bit corresponds to an existing diagnostic.

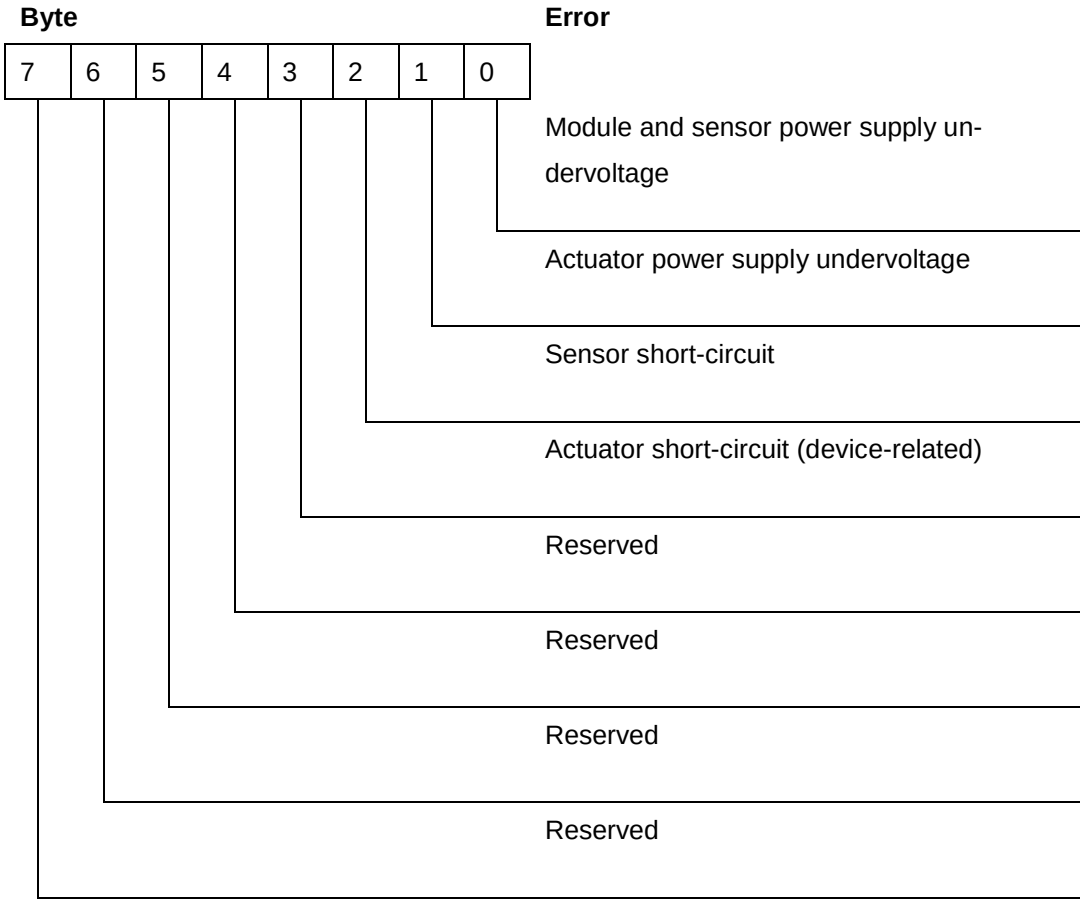


Fig. 28: Bit assignment in Object 1001H (ModuleState)

Bit assignment in Object 1002H (ActuatorShortcut)

This object contains channel-precise actuator short-circuit diagnostics. A set bit corresponds to an existing diagnostic.

Bit assignment Byte 0: relevant for DO8, DI8/DO8, DO16

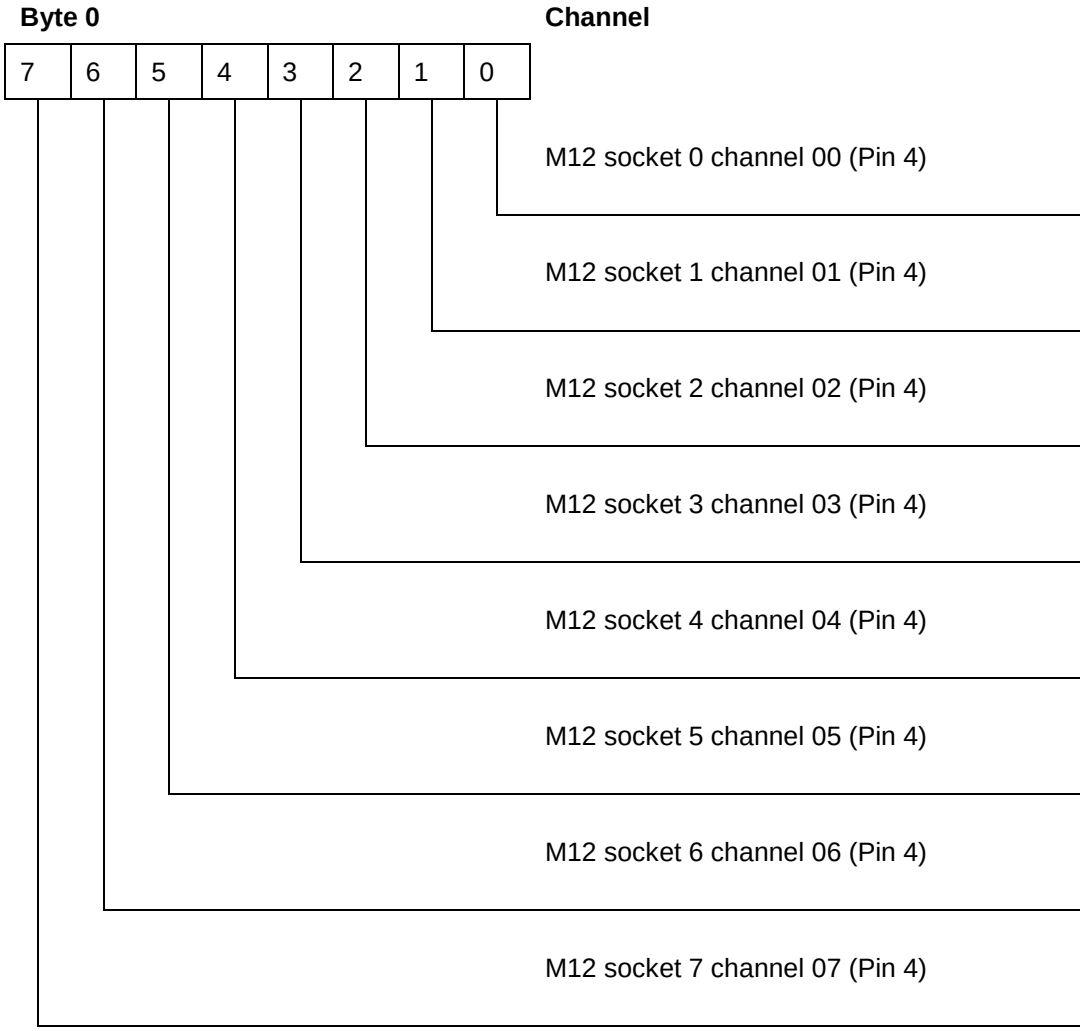


Fig. 29: Bit assignment Byte 0: relevant for DO8, DI16, DO16

Bit assignment Byte 1: relevant for DO16, DI8/DO8

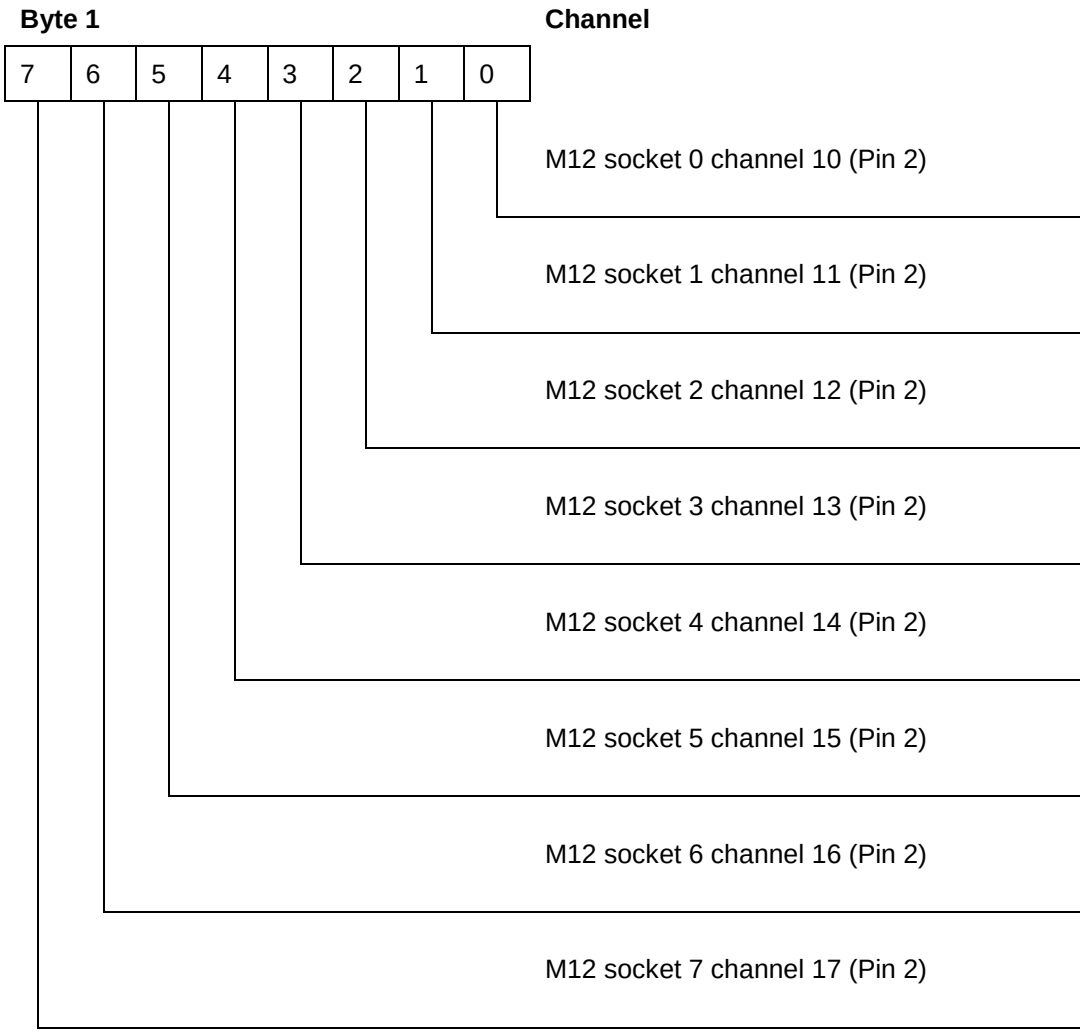


Fig. 30: Bit assignment Byte 1: relevant for DO16, DI8/DO8

7. Technical Data

7.1 Art. No. 55081 IMPACT67 EC DI16

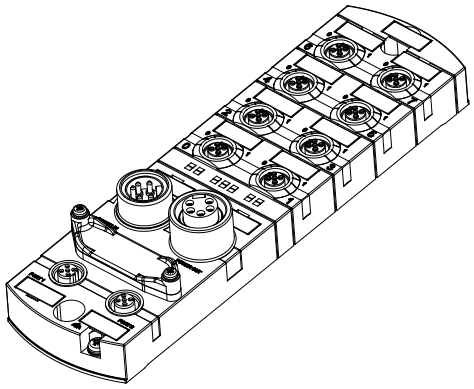
General

EtherCAT slave generic I/O Module IP67

with 16 inputs

[M12 socket, Pin 4] ☐ 8 inputs

[M12 socket, Pin 2] ☐ 8 inputs



EMC

EN 61000-4-2 ESD .....: Contact ± 4 kV, air ± 8 kV
EN 61000-4-3 RF-Field .....: 10 V/m
EN 61000-4-4 Burst .....: ± 2 kV
EN 61000-4-5 Surge .....: asym./symm. ± 500 V (DC net input)
..... asym. ± 1 kV (Signal connections)
EN 61000-4-6 HF-asymmetric .....: 10 V
EN 55011 Interference field strength .....: QP 40 dBµV/m (30 - 230 MHz)
..... QP 47 dBµV/m (230 - 1000 MHz) (class A)

Ambient conditions

Operating temperature .....: 0°C ... +55°C
Storage temperature.....: -25°C … +70°C
Enclosure type according to IEC 60529 .....: IP 67

Mechanical ambient conditions

Oscillation according to EN 60068 Part 2-6 .....: 5 - 60 Hz: constant amplitude 0,35 mm,
..... 60 – 150 Hz: constant acceleration 5 g
Shock according to EN 60068 Part 2-27.....: Amplitude 15 g, 11 ms duration

Miscellaneous

Dimensions (L × W × H) .....: 225 × 63 × 39 mm
Attachment distance.....: 208 mm
Weight .....: approx. 420 g

Bus data

Transfer protocol .....: EtherCAT
Cycle time.....: 50 µs
Electrical isolation.....: 500 V between bus and internal logic
..... by optocouplers
Vendor ID .....: 79dec, 4Fhex
Operating modes.....: Cycle
I/O data length input and diagnostics.....: 3 Byte

Connection Possibilities

Supply cable .....: 2 × connector 7/8" female / male connector
Data cable .....: 2 × M12 connector 5-pin
.....: (male connector, D-coded)
Inputs .....: 8 × 5-pin M12 connector
Maximum length of input cable.....: < 30 m

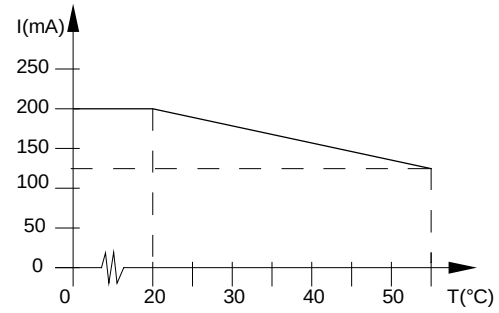
Power Supply

Voltage U_S over 7/8” power in connector .....: 24 VDC
Voltage U_S range.....: 18 – 30 VDC
Sensor supply 7/8” power in connector .....: max. 9 A
Current consumption (without In-/Output) .....: ≤ 130 mA

Inputs

Number of inputs .....: 16
Input characteristics.....: EN 61131-2 Type 2
Supply for sensors.....: max. 200 mA per socket
Short circuit protection for sensors .....: Multifuse,
..... up to 100 mA load: automatic startup
..... from 100 mA load: a reset is required
Multi-fuse reaction time (time to trip) .....: 1s at IK ≥ 1 A and 23 °C

Derating Supply for Sensors



7.2 Art. No. 55082 IMPACT67 EC DI8 DO8

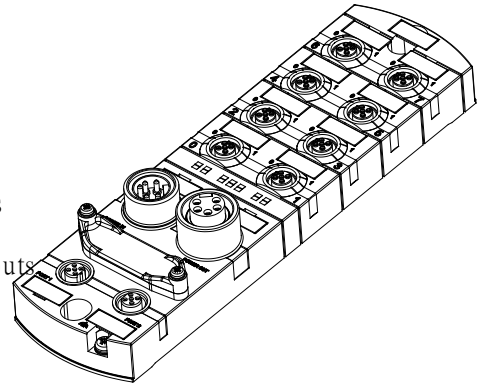
General

EtherCAT slave generic I/O module IP67

with 8 inputs and 8 outputs

[M12 socket 4, 5, 6, 7; Pin 4 and Pin 2] ☐ 8 inputs

[M12 socket 0, 1, 2, 3; Pin 4 and Pin 2] ☐ 8 outputs



EMC

EN 61000-4-2 ESD .....: Contact ± 4 kV, air ± 8 kV
EN 61000-4-3 RF-Field .....: 10 V/m
EN 61000-4-4 Burst .....: ± 2 kV
EN 61000-4-5 Surge .....: asym./symm. ± 500 V (DC net input)
..... asym. ± 1 kV (Signal connections)
EN 61000-4-6 HF-asymmetric .....: 10 V
EN 55011 Interference field strength .....: QP 40 dBµV/m (30 - 230 MHz)
..... QP 47 dBµV/m (230 - 1000 MHz) (class A)

Ambient Conditions

Operating temperature .....: 0°C ... +55°C
Storage temperature.....: -25°C … +70°C
Enclosure type according to IEC 60529 .....: IP 67

Mechanical Ambient Conditions

Oscillation according to EN 60068 Part 2-6 .....: 5 - 60 Hz: constant amplitude 0.35 mm,
..... 60 – 150 Hz: constant acceleration 5 g
Shock according to EN 60068 Part 2-27.....: Amplitude 15 g, 11 ms duration

Miscellaneous

Dimensions (L × W × H) .....: 225 × 63 × 39 mm
Attachment distance.....: 208 mm
Weight .....: approx. 420 g

Bus Data

Transfer protocol .....: EtherCAT
Cycle Time.....: 50 µs
Electrical isolation.....: 500 V between bus and internal logic
..... by optocouplers
Vendor ID .....: 79dec, 4Fhex
Operating modes.....: Poll, Change of State, Cycle
I/O data length input and diagnostics.....: 4 Byte
I/O data length output.....: 1 Byte

Connection Possibilities

Supply cable ..... : 2 × connector 7/8" female / male connector
Data cable ..... : 2 × M12 connector 5-pin
..... (male connector, D-coded)
Inputs ..... : 4 × 5-pin M12 connector
Maximum length of input cable ..... : < 30 m
Outputs ..... : 4 × 5-pin M12 connector
Maximum length of output cable ..... : with 0.75 mm² max. 10 m
..... with 0.34 mm² max. 5 m

Power Supply

Voltage U_s / U_a over 7/8” power in connector ..... : 24 VDC
Voltage U_s / U_a range ..... : 18 – 30 VDC
Actuator supply 7/8” power in connector ..... : max. 9 A
Sensor supply 7/8” power in connector ..... : max. 9 A
Current consumption U_s (without In-/Output) ..... : ≤ 130 mA

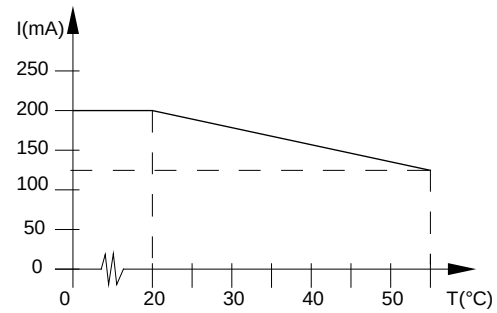
Outputs

Number of outputs ..... : 8
Actuator current load ..... : approx. 2 A per actuator
Switching frequency ..... : approx. 50 Hz 50% duty ratio
Switching frequency inductive load ..... : approx. 10 Hz 50% duty ratio
Lamp load ..... : max. 40 W

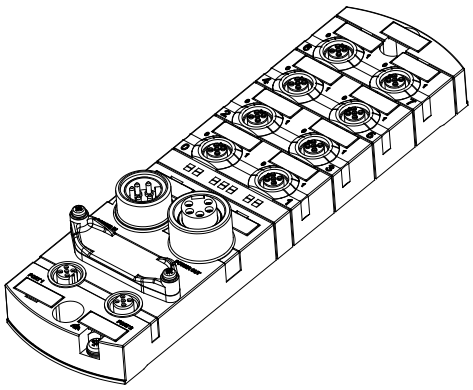
Inputs

Number of inputs ..... : 8
Input characteristics ..... : EN 61131-2, Type 2
Supply for sensors ..... : max. 200 mA per socket
Short circuit protection for sensors ..... : Multifuse,
..... up to 100 mA load: automatic startup
..... from 100 mA load: a reset is required
Multi-fuse reaction time (time to trip) ..... : 1s at IK ≥ 1 A and 23 °C

Derating Supply for Sensors



7.3 Art. No. 55083 IMPACT67 EC DO8



General

EtherCAT slave generic I/O Module IP67

with 8 outputs

[M12 socket, Pin 4] ☐ 8 outputs

EMC

EN 61000-4-2 ESD .....: Contact ± 4 kV, air ± 8 kV
EN 61000-4-3 RF-Field .....: 10 V/m
EN 61000-4-4 Burst .....: ± 2 kV
EN 61000-4-5 Surge .....: asym./symm. ± 500 V (DC net input)
..... asym. ± 1 kV (Signal connections)
EN 61000-4-6 HF-asymmetric .....: 10 V
EN 55011 Interference field strength .....: QP 40 dBµV/m (30 - 230 MHz)
..... QP 47 dBµV/m (230 - 1000 MHz) (class A)

Ambient Conditions

Operating temperature .....: 0°C ... +55°C
Storage temperature.....: -25°C … +70°C
Enclosure type according to IEC 60529.....: IP 67

Mechanical Ambient Conditions

Oscillation according to EN 60068 Part 2-6 .....: 5 - 60 Hz: constant amplitude 0.35 mm,
..... 60 – 150 Hz: constant acceleration 5 g
Shock according to EN 60068 Part 2-27.....: Amplitude 15 g, 11 ms duration

Miscellaneous

Dimensions (L × W × H) .....: 225 × 63 × 39 mm
Attachment distance.....: 208 mm
Weight .....: approx. 420 g

Bus Data

Transfer protocol .....: EtherCAT
Cycle time.....: 50 µs
Electrical isolation.....: 500 V between bus and internal logic
..... by optocouplers
Vendor ID .....: 79dec, 4Fhex
Operating modes.....: Poll, Change of State, Cycle
I/O data length input and diagnostics.....: 2 Byte
I/O data length output.....: 1 Byte

Connection Possibilities

Supply cable .....: 2 × connector 7/8" female / male connector
Data cable .....: 2 × M12 connector 5-pin
.....: (male connector, D-coded)
Outputs .....: 8 × 5-pin M12 connector
Maximum length of output cable .....: with 0.75 mm² max. 10 m
.....: with 0.34 mm² max. 5 m

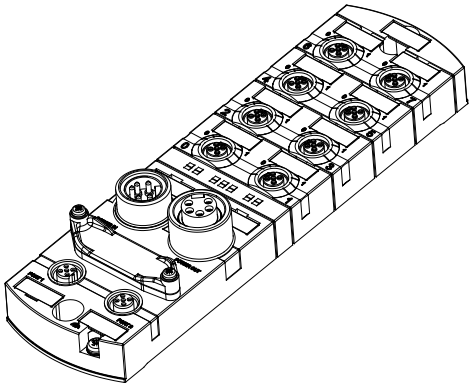
Power Supply

Voltage U_s / U_a over 7/8” power in connector .....: 24 VDC
Voltage U_s / U_a range.....: 18 – 30 VDC
Actuator supply 7/8” power in connector.....: max. 9 A
Sensor supply 7/8” power in connector.....: max. 9 A
Current consumption (without In-/Output) .....: ≤ 130 mA

Outputs

Number of outputs.....: 8
Actuator current load .....: approx. 2 A per actuator
Switching frequency .....: approx. 50 Hz 50% duty ratio
Switching frequency inductive load .....: approx. 10 Hz 50% duty ratio
Lamp load.....: max. 40 W

7.4 Art. No. 55084 IMPACT67 EC DO16



General

EtherCAT slave generic I/O Module IP67

with 16 outputs

[M12 socket, contact 4] ☐8 outputs

[M12 socket, contact 2] ☐ 8 outputs

EMC

EN 61000-4-2 ESD .....: Contact ± 4 kV, air ± 8 kV
EN 61000-4-3 RF-Field .....: 10 V/m
EN 61000-4-4 Burst .....: ± 2 kV
EN 61000-4-5 Surge .....: asym./symm. ± 500 V (DC net input)
..... asym. ± 1 kV (Signal connections)
EN 61000-4-6 HF-asymmetric .....: 3 V
EN 61000-4-8 Magnetic field 50 Hz .....: 30 A/m
EN 55011 Interference field strength .....: QP 40 dBµV/m (30 - 230 MHz)
..... QP 47 dBµV/m (230 - 1000 MHz) (class A)

Ambient Conditions

Operating temperature .....: 0°C ... +55°C
Storage temperature.....: -25°C … +70°C
Enclosure type according to IEC 60529 .....: IP 67

Mechanical Ambient Conditions

Oscillation according to EN 60068 Part 2-6 .....: 5 - 60 Hz: constant amplitude 0,35 mm,
..... 60 – 150 Hz: constant acceleration 5 g
Shock according to EN 60068 Part 2-27.....: Amplitude 15 g, 11 ms duration

Miscellaneous

Dimensions (L × W × H) .....: 225 × 63 × 39 mm
Attachment distance.....: 208 mm
Weight .....: approx. 420 g

Bus Data

Transfer protocol .....: EtherCAT
Cycle time.....: 50 µs
Electrical isolation.....: 500 V between bus and internal logic
..... by optocouplers
Vendor ID .....: 79dec, 4Fhex
Operating modes.....: Poll, Change of State, Cycle
I/O data length input and diagnostics.....: 3 Byte
I/O data length output.....: 2 Byte

Connection Possibilities

Supply cable .....: 2 × connector 7/8" female / male connector
Data cable .....: 2 × M12 connector 5-pin
.....: (male connector, D-coded)
Outputs .....: 8 × 5-pin M12 connector
Maximum length of output cable .....: with 0.75 mm² max. 10 m
.....: with 0.34 mm² max. 5 m

Power Supply

Voltage U_s / U_a over 7/8” power in connector .....: 24 VDC
Voltage U_s / U_a range.....: 18 – 30 VDC
Actuator supply 7/8” power in connector.....: max. 9 A
Sensor supply 7/8” power in connector.....: max. 9 A
Current consumption (without In-/Output) .....: ≤ 130 mA

Outputs

Number of outputs.....: 16
Actuator current load .....: approx. 0.5 A per actuator
Switching frequency .....: approx. 50 Hz 50% duty ratio
Switching frequency inductive load .....: approx. 10 Hz 50% duty ratio
Lamp load.....: max. 10 W

Abbreviations

Description of device profile for generic input and output modules

CMS CAN	CAN based message specification: A service element available to the application layer for the manipulation of objects.
COB	Communication Object: Messages are transmitted in the network in COBs and viewed as communication objects.
COB-ID	COB Identifier: Each communication object is unambiguously defined by the COB-ID. The COB-ID marks the communication object's priority.
CSMA/CA	Carrier Sense Multiple Access / Collision Avoidance
DBT	COB-ID Distributor. A service element of the application layer; it assigns the COB-IDs to the communication objects of the CMS services.
DI	Digital Input
DIN	Deutsches Institut für Normung: German standards institute.
DO	Digital Output
EN	European Standard
EEC	European Economic Community
EMC	Electromagnetic Compatibility
IEC	International Electrotechnical Commission
ISO	International Standards Organization
LED	Light Emitting Diode
LMT	Layer Management. Enables the setting of layer-related parameters to a node.
NMT	Network Management. NMT provides services for initializing and monitoring the nodes in a network.
MNS	Module Network Status
OSI	Open Systems Interconnection
PDO	Process Data Object. Object for process data exchange between various devices.
RTR	Remote Transmission Request. Request for data telegram with the same identifier used for data transmission.
SDO	Service Data Object, Objects for access and manipulation to data in the object directory.
PLC	Programmable Logic Controller
SYNC	Synchronization Object

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